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VOL. XXIII.

MAMMALIA.

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MEMOIR

OF

SIR HANS SLOANE.

MEMOIR

OF

SIR HANS SLOANE.

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WHATEVER may have been the influence of Sir Hans Sloane on the progress of Natural History in his day, (and we believe it to have been considerable,) to the present generation he is most advantageously known as the founder of the British Museum; it may not, therefore, be uninteresting, before relating his personal history, to give some account of the private museums that were in existence previous to his time, especially as some of them merged into his own splendid collection, which ultimately became the property of the public.

The first attempt at forming a Museum in Britain, was made early in the seventeenth century, by John Tradescant, a native of Holland,

who is supposed to have arrived in this country during the reign of Elizabeth, and afterwards to have been in the service of the Lord Treasurer Salisbury, and Lord Wooton. He travelled into various parts of Europe, and, in 1620, was on board of a vessel forming part of a fleet sent against the Algerines. Availing himself of that opportunity of pursuing his favourite studies, he collected plants from Barbary and the Mediterranean Islands, and a few years after we find him settled at Lambeth, where he founded a celebrated Botanic Garden; and, in 1629, obtained the title of Gardener to the King, (Charles I.) Here he established his museum, which was the wonder of the age, and was known as Tradescant's Ark. It was much frequented by the principal nobility, who contributed specimens; and among the names of these his "benefactors," as he terms them, appear those of the King and Queen, Archbishop Laud, the Duke and Duchess of Buckingham, &c.

At what period he died, we are not informed, though it is conjectured about 1652; he was certainly dead in 1656, when his son published a catalogue of the contents of his "Ark," under the following title: "Musæum Tradescantianum; or a Collection of Rarities Preserved at South Lambeth, near London." He arranges "the materialls" under "two sorts; one Naturall, of which some are more familiarly known and named

amongst us, as divers sorts of birds, four-footed beasts, and fishes, to whom I have given usual English names. Others are less familiar; and, as yet, unfitted with apt English terms, as the shell-creatures, insects, minerals, outlandish-fruits, and the like, which are part of the Materia Medica (encroachers upon that faculty may try how they can crack such shells.) The other sort is Artificials, as utensills, householdstuffe, habits, instruments of warre used by several nations, rare curiosities of art, &c. These are also expressed in English, (saving the coynes, which would vary but little if translated,) for the ready satisfying whomsoever may desire a view thereof. The catalogue of my garden I have also added in the conclusion, (and given the names of the plants both in Latin and English,) that nothing may be wanting which at present comes within view, and might be expected from, your ready friend, John Tradescant." The work, which is now exceedingly rare, contains engraved portraits by Hollar, of the father and son. Under the father's head is the following inscription: — "Johannes Tradescantus Pater, rerum selectarum insignem supellectilem in Reconditorio Lambethiano, prope Londinum, etiamnum visendam primus instituit ac locupletavit." Under that of the son are these lines, "Johannes Tradescantus Filius, genii ingeniique paterni verus heres, relictum sibi rerum undique

congestarum thesaurum, ipse plurimum adauxit et in Museo Lambethiano amicis visendum exhibet."

In a very short time after this, the family became extinct, for the son who inherited the museum died in 1662. He, by a deed of gift, dated December 16, 1659, had bestowed the collection on Elias Ashmole, who lodged in his house, and had obtained great celebrity by the publication of his "Theatrum Chymicum Britannicum." Mrs Tradescant, however, the donor's widow, contested Ashmole's right to the Museum, which obliged him to prefer a bill in Chancery against her; and it was not till 1674, that, pursuant to a decree of the court, she delivered up the property.

Ashmole materially increased the collection in various departments, but more particularly in coins, medals, and manuscripts. In October, 1677, he offered to give the whole to the University of Oxford, provided they would erect a building fit to receive them, to which proposition the University willingly assented. On Thursday, May 15, 1678, the first stone of the Ashmolean Museum was laid; and being finished in March, 1682, the collection was transferred there, and the articles arranged by Dr Plot. On the 21st of May following, the building was opened for public inspection, and was visited by

the Duke of York, (afterwards James II.) with his Duchess, and the Princess Anne, (afterwards Queen of England.) It may be proper to mention, that among the remnants of Tradescant's collection still preserved, there are the bill and foot of the Dodo, (*Didus ineptus*, Lin.*) a bird no longer in existence. "It was first seen by the Dutch when they landed on the Isle of France, at that time uninhabited, immediately after the discovery of a passage to the East Indies by the Cape of Good Hope. It was of a large size and singular form; its wings short, like those of an Ostrich, and wholly incapable of sustaining its heavy body even for a short flight. In its general appearance it differed from the Ostrich, Cassowary, or any known bird."† "The death of a species," says Mr Lyell, "is so remarkable an event in Natural History, that it deserves commemoration; and it is with no small interest that we learn from the archives of the University of Oxford, the exact day and year when the remains of the last specimen of the Dodo, which had been permitted to rot in the Ashmolean Museum, were cast away. The relics, we are told, were "a Museo subducta, annuente Vice-cancellario aliisque cura-

* The Dodo is now supposed to form the *Rasorial* type among the *Valuidæ*. See an excellent paper in the Nouvelles Annales des Sciences Naturelles.

† Lyell's Principles of Geology, vol. ii. p. 157, 8vo. edit.

toribus, ad ea lustranda convocatis die Januarii, 8vo, 1755." That the specimen was entire in Tradescant's time we have proof, as it is enumerated among his "Whole Birds," in the following terms:*—"Dodar, from the Island Mauritius; it is not able to fly, being so big."† And as illustrating the history of another species, that is now almost extirpated from *this* country, may be mentioned his notice of the Bustard, (*Otis tarda,*) "as big as a Turkey, usually taken by grayhounds on Newmarket heath."

To Tradescant succeeded two other celebrated collectors of natural curiosities,—William Courten, Esq. and Mr James Petiver. The former was the grandson of a wealthy merchant, whom James I. created a baronet, and was born in the parish of Fenchurch, in London, March 28, 1642. His father having become insolvent the following year, he quitted the kingdom, and died at Florence in 1655. The son appears to have received a good education notwithstanding, and early in life was sent to complete his studies abroad; and at Montpelier is supposed to have first met with Sir Hans Sloane, with whom he soon formed an intimacy that ripened into a friendship, which continued, without interruption, to the end of

* A painting, now in the British Museum, was made from the living bird, by George Edwards, who lived between 1698 and 1773.

† Mus. Trad. p. 4.

his life. Soon after he came of age, he returned to London for the purpose of recovering the remainder of his father's and grandfather's fortunes from the hands of a Mr Carew, who had obtained letters of administration to the estates of the Courten family; but, after some time, he compromised the case, and, "by a bond, surrendered all claims to the administration, for valuable considerations not specified; adding, that whatever he had received from the wrecks of the fortune of his father, was *ex dono et gratia*, and not *ex jure*. He even relinquished his family name of Courten, and assumed that of William Charlton, and publicly announced his intention of quitting England, and living in a strange land."*

He is supposed to have remained abroad many years, and it must have been during this interval that he became acquainted with Sloane. In 1669, he began to collect coins and medals. To what extent his curiosities increased may be seen from the following notices of his museum, gleaned from the contemporary Diaries of Evelyn and Thoresby. "December 16, 1686, I carried the Countesse of Sunderland to see the rarities of one Mr Charlton, in the Middle Temple, who shew'd us such a collection as I had never seen in all my travels

* Chalmers' Biographical Dictionary, art. Courten.

abroad, either of private gentlemen or princes. It consisted of miniatures, drawings, shells, insects, medals, natural things, animals, (of which divers, I think one hundred, were kept in glasses of spirits of wine,) minerals, precious stones, vessels, curiosities in amber, christal, agate, &c. all being very perfect and rare in their kind, especially his books of birds, fish, flowers, and shells, drawn and miniatured to the life. He told us that one book stood him in £300; it was painted by that excellent workman whom the late Gaston, Duke of Orleans, employed. This gentleman's whole collection, gathered by himself travelling over most parts of Europe, is estimated at £8000. He appears to be a modest and obliging person."*

"March 11, 1690, I went again to see Mr Charlton's curiosities, both of art and nature, and his full and rare collection of medals, which, taken altogether, in all kinds, is doubtless one of the most perfect assemblage of rarities that can be any where seen. I much admired the contortions of the thea root, which was so perplexed, large, and intricate, and, withal, hard as box, that it was wonderful to consider."†

"November 30, 1691, I again saw Mr Charlton's collection of spiders, birds, scorpions, and other serpents, &c."‡

* Evelyn's Diary. † Ibid. ‡ Ibid.

Thoresby thus mentions it under the date of May 24, 1695. "Walked to Mr Charlton's chambers at the Temple, who very courteously shewed me his museum, which is, perhaps, the most noble collection of natural and artificial curiosities, of ancient and modern coins and medals, that any private person in the world enjoys; it is said to have cost him £7000 or £8000 sterling; there is, I think, the greatest variety of insects and animals, corals, shells, petrifactions, &c. that ever I beheld. But I spent the greatest part of my time amongst the coins; for though the British and Saxon be not very extraordinary, yet his silver coins of the emperors and consuls is very noble. He has also a costly collection of medals of eminent persons in church and state, domestic and foreign reformers. But before I was half satisfied, an unfortunate visit from the Countess of Pembroke, and other ladies from court, prevented farther queries," &c.*

Obadiah Walker's treatise on "Greek and Roman History, illustrated by coins and medals,"† is dedicated to "William Charlton of the Middle Temple, Esq." in which he says, "your eminency in this study, and your plentiful and (not without great skill and difficulty) well chosen treasure,

* Thoresby's Diary, vol. i. p. 299.

† 8vo. 1692.

both for this and other parts of Natural History, and your unparalleled readiness to further and assist all ingenious lovers of this most copious and gentle study," do justly challenge a more universal and public testimony of your singular worth and eminent goodness."

He died at Kensington Gravel Pits, March 26, 1702, aged sixty, and was buried in the churchyard of that parish, having bequeathed his museum to Sir Hans Sloane.

Mr Petiver was a wealthy apothecary, who resided in Aldersgate street, in London, "a person," says Sloane, "sufficiently known by his understanding in Natural History *all over the world!*" He distributed printed lists and directions among captains and surgeons of ships, bound to foreign parts; and by these means procured a very extensive and valuable collection, of which he published short catalogues at successive dates, as his curiosities increased. The first commences in 1695, and is entitled "Musei Peteveriani, Centuria Prima, Rariora Naturæ continens, viz. Animalia, Fossilia, Plantas, ex variis Mundi Plagis advecta, Ordine digesta, et Nominibus Propriis Signata." These were continued to the number of ten centuries, the last being published in 1703, and of course describing one thousand articles; the greater part, however, are plants. He also enumerates his "generous benefactors," and

to the list appends the following amusing " P.S. I hope the generous example of these curious persons will excite and encourage others, who travel to or reside in foreign parts, to do the like for me; especially, since the preserving of all animals, vegetables, and fossils, is so easily performed according to my printed directions, which I am ready and free to give to all such as will be so kind to make collections for me, and, as I have elsewhere hinted, the most common as well as rare,—*i. e.* whatever they meet with, either of plants, shells, insects, fossils, &c.—will be highly acceptable to me, and shall, on all occasions, be gratefully acknowledged by your most obliged and humble servant, James Petiver." He died, April 20, 1718, and his museum was purchased by Sir Hans Sloane for L.4000,—an immense sum for that period, when the value of money was so much greater than at present.

Having thus traced the first of these collections till it was rendered of general utility by being placed at the service of the public, and the other two into the possession of the individual who so laudably adopted the same plan in their final disposal, we now offer a brief notice of the life of the generous testator.

Alexander Sloane, a native of Scotland, was at the head of that colony of his countrymen which James I. settled in the north of Ireland. He became

collector of taxes for the county of Down, and after the restoration of Charles II. commissioner of Array; he died at Killileigh, in that county, in 1666, where, on the 16th of April, 1660, his seventh and youngest son, Hans, was born.* Being naturally of a delicate constitution, which excluded him from the usual boisterous pursuits of youth, he appears to have had recourse to the study of nature at a very early age; and having determined on following the medical profession, entered on the necessary studies with diligence and ardour. But at the age of sixteen, these were unfortunately interrupted by a spitting of blood, with which he then became afflicted. This confined him to his chamber for three years. By a rigid course of temperance, abstaining entirely from wine and other fermented liquors, he succeeded in conquering the disease, and his own prudence induced him to continue ever after in a great degree to adhere to the same strict regimen. It was his favourite maxim, "that sobriety, temperance, and moderation, are the best preservatives that nature has vouchsafed to mankind;" and he himself was certainly a proof of its efficacy, as by attention to this maxim, his own life far exceeded the allotted period of man's ordinary existence.

* His mother was Sarah, daughter of Dr Hickes, prebendary of Westminster, and chaplain to Archbishop Laud.

Upon his recovery, he resorted to London for the purpose of attending his professional studies. The Botanic Garden at Chelsea had at that time very recently been established by the Company of Apothecaries.* Here he became an indefatigable student, attending also lectures on chemistry. anatomy, and physic. At this period, he formed an acquaintance with the two eminent philosophers, Boyle and Ray, with whom he ever after lived on the most friendly terms. After four years of severe application in London, for his farther improvement he determined to visit the Continent; and in company with two fellow students, one of whom was Mr (afterwards Sir Tancred) Robinson, crossed over to Dieppe, and from thence to Paris, where he attended the botanical lectures of the celebrated Tournefort, and those of Du Verney for anatomy; at the conclusion of which, he visited Montpelier, taking with him letters of recommendation from Tournefort to Monsieur Chirac, then chancellor and professor of

* In 1673, they obtained a lease of a piece of ground, containing three acres one rood, for sixty-one years, at a ground rent of £5 per annum, of which Sir Hans Sloane, in 1721, granted them the freehold. In 1732, a spacious greenhouse was erected, and the grounds laid out anew, and systematically arranged. It is now said to be suffering materially from the confined situation and smoky air consequent upon the vast increase of London.

that University; by which means, he obtained introductions to all the learned of that neighbourhood. Being delighted with the attentions he received from Monsieur Magnol, the professor of botany, whose herbarizing excursions in the neighbourhood he always attended, he parted from his two companions, who continued their travels in Italy, while he remained for a twelvemonth collecting plants; and then, pursuing the same occupation as he travelled through Languedoc, he returned to Paris by way of Thoulouse and Bourdeaux. After a short residence in the metropolis, he set out for England in the latter end of 1684, with an intent to settle and follow his profession, having, it is believed, taken his degree of M.D. at Montpelier.

Soon after his return to London, he became acquainted with the celebrated Dr Sydenham, in whose family he became domesticated, and was by him introduced to professional practice. On the 26th November, 1684, he was proposed by Dr Martin Lister, as a candidate for the Royal Society, of which he was elected a member on the 21st of January following. From this time, he became a regular attendant on and frequent contributor to the society; so that, in July the same year, he was a competitor for the office of their assistant secretary, but Dr Halley was the

successful candidate, being elected by a majority of sixteen, the numbers being twenty-five and nine. On the 12th of April, 1687, he was chosen a Fellow of the College of Physicians.

Flattering as were his prospects at home at this period, he did not hesitate to accept an appointment abroad, which promised to afford him the means of enlarging his knowledge of Natural History and Medicine. The Duke of Albemarle having been appointed governor of Jamaica, applied to his physician, Doctor Barwick, to recommend him a proper person to accompany him to the colony in a professional capacity, who consulted Sloane on the occasion. This appeared to the latter too tempting an opportunity for self-improvement to neglect, and having asked a short time to consider the matter, offered himself, and was accepted. In a letter to Ray, Sloane thus mentions the subject: "I have talked a long while of going to Jamaica with the Duke of Albemarle as his physician; which, if I do, next to the serving his grace and family in my profession, my business is to see what I can meet withal that's extraordinary in nature in these places. I hope to be able to send you some observations from thence, God Almighty granting life and strength to do what I design,"* to which

* Ray's Philosophical Letters, page 206.

Ray replies, "If you go to Jamaica, I pray you a safe and prosperous voyage. We expect great things from you, no less than the resolving all our doubts about the names we meet with of plants in that part of America, as the Dildoe, Mammee, Mangrove, Manchinello, Avellanæ purgatrices, the Sower-sop and Custard apple.* Of most of which, though I am pretty well informed and satisfied by Dr Robinson, yet I shall be glad to be either confirmed, or better informed by so knowing and curious an observer as yourself. I should be glad to know what manner of fruit the Mandioca bears; for, whatever some have written, that it is not without, I am confident. You may also please to observe, whether there be any species of plants common to America and Europe, and whether Ambergrise be the juice of any sort

* A contemporary of Sloane's, gives this account of the custard apple:—"When it is ripe we gather it, and keep it one day, and then it is fit to be eaten. We cut a hole at the lesser end (that it may stand the firmer in the dish) so big, as that a spoon may go in with ease, and with the spoon eat it. Never was excellent custard more like itself, than this to it; only this addition, which makes it transcend all custards that art can make, though of natural ingredients, and that is a fruity taste, which makes it strange and admirable. Many seeds there are in it, but so smooth, as you may put them out of your mouth with some pleasure." Ligon's "True and Exact History of the Island of Barbadoes, 1673."

of metal or aloe dropt into the sea,* as Trapham would have it. What kind of Arundo it is, the same author calls the Dumb-cane; as also what his animal seeds may be. The shining barks of trees which he mentions deserves observation, because I find nothing of them in other writers," &c.†

With these instructions he prepared for his voyage; and at length, on Monday, September 12, 1687, he went on board his Majesty's ship, Assistance, forty-four guns, commanded by Captain Lawrence Wright, then lying at Spithead. They weighed anchor the same afternoon, and reached Madeira on Friday, 21st October. "Considering," says he, "that this island had not been very anciently inhabited, being but discovered in the fourteenth century, and that common fame relates all the inhabitants hereof to be criminals banished hither, I expected to have found a great deal of barbarity and rudeness here, and nothing else; but on going ashore, I was very much disappointed, for I have not seen any where more accomplished gentlemen than here, having all the civility one could desire." His medical skill was in great demand during the ten days he remained

* It is almost needless to remark, that it is now ascertained that this substance is a concretion formed in the stomach or intestines of the *Physeter macrocephalus*, or Spermaceti whale.

† Letters, page 209.

here; but on Sunday they quitted the island, and two days after, he notices that they "first took dolphins with fis-gigs, or sharp arrow-headed or bearded irons, fitted with poles of about ten feet long, lead for the more convenient striking them, and a rope or line tied to them to hold the fis-gig, which is shot at them by the strength of the hand, when they come within reach of those waiting for them, usually on some of the yardarms, backhead, or poop; in which fishing, the great matter seems to be, to allow for the refraction of the water. They were laid in wait for, not only so, but likewise with lines and hooks, which were hung out, baited with rags, in the shape of flying fish, and so adjusted as to hang, sometimes to touch the water, at others not, according to the waves, thereby imitating the flying-fish, which the dolphins pursue with great greediness. Dolphins are reckoned the swiftest swimmers that are, their bodies being contrived for that purpose. There is as much pleasure in seeing them pursue the flying fish as in hunting or hawking; the flying-fish getting out of the water, where the dolphins cannot pursue them." They cooked one they had caught, which, Sloane observes, "was dry, though pretty good victuals, and well tasted; the nearer the head the more it is prized: although," he humorously adds, "I am apt to think, that if this fish, so much commended by sailors, were ashore in a market where

other fish were to be had, it would not be counted so great a delicacy."

On the 25th November, they reached Barbadoes, where they were hospitably entertained by Sir Edwin Steed, the governor. "For my own part," says Sloane, "I liked so well the dessert after dinner, which consisted of shaddocks, guavas, pines, mangrove-grapes, and other unknown fruits in Europe, that I thought all my fatigues well bestowed when I came to have such a pleasant prospect." He enjoyed these luxuries for ten days, when they again put to sea, and passed St Lucia, Martinique, Dominica, Guadaloupe, Montserrat, and once more landed at Nevis, on Friday, December 9th, but quitted it again on the 11th, and in five hours reached St Christophers, at that time occupied by both French and English, the former being in possession of the extremities, and our countrymen of the centre. The governor "treated his Grace the Duke of Albemarle; and the French governor, hearing of his coming ashore, sent him a compliment by an officer." From thence they proceeded by St Eustache, Saba, Santa Cruz, Mona, Altabella, "famous for turtles, where are a great many eggs laid by them in the sand, which are there hatched," and Hispaniola; and, finally, on the 19th December, they came into Port Royal Harbour.

Dr Sloane had, during the voyage, availed himself of every opportunity of examining the

natural productions of the different islands at which he touched. In botany, more particularly, he made great collections, and anticipated a rich harvest, now that he had reached Jamaica, when an unexpected event blighted all his prospects in this quarter. The Duke of Albemarle died almost as soon as he had landed; and the Duchess, naturally anxious to return to England, only awaited instructions from the Court at home, in reply to her notification of the Duke's decease. During the necessary interval, the doctor assiduously exerted himself, and visited all parts of the island. He recorded in a journal a description of every natural curiosity; he collected about eight hundred plants, and employed an artist to make drawings of the birds, fishes, insects, shells, and fruits. Some of his observations, selected at random, will probably amuse readers of the present day.

"I was somewhat surprised to see serpents, rats, and lizards, sold for food, and that *to understanding people*, and of a very good and nice palate; but what of all those things was most unusual, and to my great admiration, was the great esteem was set on a sort of cossi or timber-worms, called cotton tree worms by the Negroes or Indians."

The two following stories are much akin to the marvellous relations we frequently meet with in the American newspapers.

"There was an alligator that used to do abundance of mischief to the people's cattle in the neighbourhood, having his regular course to look for prey. One of the inhabitants there, as I was told, tied a long cord to his bedstead, and to the other end of the cord fastened a piece of wood and a dog, so that the alligator, swallowing the dog and piece of wood, the latter came cross his throat as it was designed, and *after pulling his bedstead to the window, and awakening the person in bed*, he was caught. Alligators love dogs extremely, but prey also on cattle. This alligator was nineteen feet long."

"I once went to visit Mr Rowe, a sick person, at St Jago de la Vega, in Jamaica, in a morning, and found him more than ordinarily discomposed; for that the ants, by eating in the night some of the joints of his bedstead, his bed of a sudden had fallen to the ground."

Mr Knapp, in his elegant and highly interesting "Journal of a Naturalist,"* has remarked how slowly the potato was received into England as an article of food, and that it was entirely confined to the use of the lower classes for many years.† An observation of Sloane's (writing so

* Page 33.

† From an anecdote in the Retrospective Review, vol. xi. p. 331, it appears that about seventy years ago, they were beginning to be appreciated as a delicacy in the neighbourhood of London. A lady then living, (1825,)

late as 1707, be it observed) may be adduced in confirmation of this fact. In speaking of the great variety of food mankind is sustained by, he says,* " Many live on the Irish patatas, *a sort of Solanum, on which, I have heard, they live in the mines of Potosi, and in Ireland*;" and in his Account of Jamaica Plants,† he describes the potato in the following terms: " The root is tuberous; for shape and bigness very uncertain; but being for the most part oblong, as big as a hen's egg; from a swelled middle tapering to both extremes; yellow and sweet within; when roasted, tasting like a boiled chestnut, and having many fibrils by which it draws its nourishment. The stalks are green, a little covered, and creeping for many feet in length along the surface of the earth, and putting forth leaves and flowers at every inch's distance," &c. " In four months after planting, they are ready to be gathered, the ground being filled with them, and if they continue therein any longer, they are eaten by worms."

who had resided all her life near the road from London to Epsom, states, that " in her youth she used to look forward with much pleasure to the quarter days, when the tenants dined at her father's house, *because on these days only was she treated with a dish of potatoes.*"

* Introduction to Natural History of Jamaica, vol. i. p. 21.

† Natural History of Jamaica, vol. i. p. 150.

But to resume the narrative. Having remained only fifteen months in the island, Dr Sloane re-embarked in the Assistance frigate, on the 16th March, 1689, and reached England on the 29th May. During the interval of his absence from this country, the Revolution had occurred, of which he appears to have received the first tidings within a few leagues of Plymouth. "I was sent," he relates, "in an armed boat, to get certain knowledge of the situation of public affairs, and to give a speedy account of it to the Fleet, who were to stand off of that port, till they were assured of their safety or danger. We had sight first of a boat, which was fishing some leagues from the land, whose master did what he could to fly from us; but, coming up with him, asking what news, and where the king was, he asked, — *what king we meant*, for that King William was well at Whitehall, and King James in France."

He had attempted to bring home some living reptiles, but without success. The following is his account of the failure of his endeavours: — "Though I foresaw the difficulties, yet I had an intention to try to bring with me from Jamaica some uncommon creatures alive, such as a large yellow snake, seven feet long; a guana, or great lizard; a crocodile, &c.; and I had the snake tamed by an Indian, whom it would follow as a dog

would his master; and after it was delivered to me, I kept it in a large earthen jar, such as are for keeping the best water for the commanders of ships during their voyages, covering its mouth with two boards, and laying weights upon them. I had it fed every day by the garbage of fowl, &c. put into the jar from the kitchen. Thus it lived for some time, when, being weary of its confinement, it shoved asunder the two boards on the mouth of the jar, and got up to the top of a large house, wherein lay footmen and other domestics of her grace the Duchess of Albemarle, who, being afraid to lie down in such company, shot my snake dead.* It seemed, before this disaster, to be very well pleased with its situation, being in a part of the house which was filled with rats,

* There is a figure given of this snake in vol. ii. plate 274; and the author, describing it in page 335, says, "They feed on birds, rats, &c. which they swallow whole; and therefore Nature has given them such a folded or rugous inward tunicle of the stomach, that it may extend and receive things of large dimensions. Many of them have been killed with thirteen or fourteen rats in their bellies.

"An Indian brought this figured here, and several others to me. He used to take them behind by their necks, so that they could not bite him; then he would give them leave to twist themselves about his arm as they pleased. He killed them by putting their tails under his foot, taking them behind their necks, and stretching their back-bones, and twisting and pinching hard their lungs and *tracheæ arteriæ*.

which are the most pleasing food for these sort of serpents. It is upon this account that the European nations inhabiting the countries producing sugar, do not molest these creatures, because they destroy the rats, (which came originally from ships cast away on the coast, &c.) which multiply strangely there, and do infinite mischief to the sugar canes, not only by eating them, but spoiling the juice of those they gnaw.

"The guana used to feed on calabash pulp, and lived very well on board of the yacht, till one day, when it was running along the gunnel of the vessel, a seaman frighted it, and it leaped overboard and was drowned.

"The Crocodile, or Alligator, I kept in a tub of salt water towards the forecastle, and fed it with the same sort of food as the snake, but it died on the 15th of May. Thus I lost, by this time of the voyage, all my live creatures; and so it happens to most people, who lose their strange live animals for want of proper air, food, or shelter."

Immediately on his arrival, he settled as a physician. The collections he had brought home with him excited the curiosity and admiration of the learned, and contributed to his public fame. "Several circumstances," says Dr Pulteney,* "concurred respecting the voyage of Dr Sloane

* History of the Progress of Botany in England, vol. ii. p. 69.

to Jamaica, which rendered it peculiarly successful to Natural History. He was the first man of learning whom the love of science alone had led from England to that distant part of the globe, and consequently the field was wholly open to him. He was already well acquainted with the discoveries of the age: he had an enthusiasm for his object, and was at an age when both activity of body and vivacity of mind concur to vanquish difficulties." His reputation was now so great that, on the 30th November, 1693, he was elected secretary of the Royal Society; and, in accordance with his active character and ardent zeal for the interests of science, he immediately revived the publication of the "Philosophical Transactions," which had been interrupted from the year 1687. He continued in this office till 1712, when he was succeeded by Dr Halley, who, we have seen, had been the successful competitor with Sloane for the office of assistant secretary in the year 1685, and who, subsequent to the voyage of the latter to Jamaica, had also crossed the Atlantic to visit the British settlements in America for astronomical purposes, returning in September, 1700.

Dr Sloane's professional fame now rapidly extended. In October, 1694, he was chosen physician to Christ's Hospital; and his circumstances appear to have been in so flourishing a condition as to justify his refusal to receive the

emoluments of that office; but, because he would not offer a precedent that might be injurious to his successors, he punctually took the money, but constantly applied it to the relief of those belonging to the Hospital who were in greatest need. This appointment he filled till 1730, when age and infirmities obliged him to resign. As it is as a naturalist and patron of science he is connected with this work, we shall merely enumerate his professional appointments and honours, which were very numerous; and it is sufficient to mention, that, in the College of Physicians, he warmly promoted the plan of a Dispensary for the sick poor, which met with so much opposition from the apothecaries, and which gave rise to Dr Garth's well known satire.

Although the Doctor does not appear to have been in her Majesty's household,* we are told that he was frequently consulted by Queen Anne,

* It has been stated, in the "History of Europe for 1712," that "Dr Hans Sloane was sworn physician to Queen Anne in the room of Dr Shadwell;" but we suspect that this is a mistake, as we are not aware that Dr Shadwell was displaced from that appointment, and he held it both under George I. who knighted him, and George II.; indeed, till his death, which happened December 4, 1747; unless it occurred in this way, — Dr Shadwell's name stands in Chamberlain's "Present State of Great Britain for 1710" as Physician Extraordinary to the Queen. Perhaps, by the death of one of her physicians in ordinary, Shadwell might succeed to

and that, in her last illness, she was blooded by him; but, soon after the accession of George I. he was created a baronet,* being the first English physician on whom an hereditary title of honour had been conferred, and was appointed physician general to the army, which office he enjoyed till 1727, when George II. made him his own physician. He had, in 1719, been elected President of the College of Physicians, which high honour he continued to hold till 1735, when he resigned.

During the intervals of relaxation from a life so laborious as that of an eminent London physician, Dr Sloane arranged his Collections and Observations, formed while in the West Indies, and, preparatory to his great work, printed, in 1696, 8vo. his Catalogue of Jamaica plants, with the following title: "Catalogus Plantarum quæ in Insula Jamaica, sponte proveniunt, vel vulgo coluntur, cum earundem synonimis et locis natalibus, Adjectis aliis quibusdam quæ in Insulis Madeira, Barbadoes, Nevis, et Sancti Christopheri nascuntur; ceu Prodromi Historia Naturalis Jamaica, pars prima." This he

that office, and Sloane thus obtain the appointment o. physician extraordinary, which would explain the fact of his being called in to attend her Majesty's death-bed.

* April 3, 1716.

dedicated to the Royal Society and College of Physicians. "This volume," says Dr Pulteney, "intrinsically valuable as it is, may yet be considered as only the nomenclature or systematic index to his subsequent work. The arrangement of the subject (and which was strictly followed in the History) is nearly that of Mr Ray; vegetables being thrown into twenty-five large natural classes or families. Among botanists of that time, generical characters had not attained any remarkable precision; and Sloane, like Plukenet, was little farther anxious than to refer his new plants to some genus already established, without a minute attention to the parts of fructification, farther than as they formed part of the character drawn from habit; yet, with this defect, the figures and descriptions of Sloane proved sufficiently accurate to enable his successors to refer almost all his species to the appropriate places in the system of the present day."

Eleven years after, appeared the first volume of his "Natural History of Jamaica." This is a splendid folio, entitled "A Voyage to the Islands Madeira, Barbados, Nieves, St Christophers, and Jamaica, with the Natural History of the Herbs and Trees, Four-footed beasts, Fishes, Birds, Insects, Reptiles, &c. of the last of these islands, to which is prefixed an Introduction, wherein is an Account of the Inhabitants, Air, Waters,

Diseases, Trade, &c. of that place, with some Relations concerning the neighbouring continent and islands of America. Illustrated with the Figures of the Things described, which have not been heretofore engraved. By Hans Sloane, M.D. Fellow of the College of Physicians, and Secretary of the Royal Society. Vol. I. 'Many shall run to and fro, and knowledge shall be increased,' Dan. xii. 4. London: printed by B.M. for the Author, 1707."

It is dedicated to Queen Anne in the following terms:—

TO HER MOST EXCELLENT MAJESTY,
THE QUEEN,
THIS
NATURAL HISTORY OF JAMAICA,
ONE OF
THE LARGEST AND MOST CONSIDERABLE
OF
HER MAJESTY'S PLANTATIONS
IN
AMERICA,
IS, WITH ALL HUMILITY, DEDICATED,
BY
HER MAJESTY'S MOST DUTIFUL AND
MOST OBEDIENT SUBJECT,
HANS SLOANE.

The introduction, consisting of one hundred and fifty-four pages, contains a general account of the West Indies, their discovery, climate,

rivers, soil, productions, customs, trade, and diseases, and more particularly those of Jamaica; then follows an account of his voyage in forty-eight pages, and the remainder of the book, occupying two hundred and sixty-four pages, is taken up with an account of the plants, of which he makes the following arrangement.

CHAPTER 1. Of submarine plants.
Under which head he includes Corals, &c.
2. Of mushrooms, mosses, &c.
3. Of ferns, or capillary plants.
4. Of herbs with grassie leaves.
5. Of herbs with less perfect or staminious flowers.
6. Of herbs with monopetalous flowers.
7. Of verticillated plants.
8. Of herbs that are leguminous, or have a papilionaceous flower.
9. Of herbs whose flowers are composed of two or three petala or leaves.
10. Of herbs whose flowers are composed of four petala or leaves.
11. Of Vasculiferous Herbs with pentapetalous flowers.
12. Of herbs which are of the kindred of umbelliferous plants.
13. Of plants that are rough leaved, called Asperifolia.
14. Of herbs commonly accounted to have many naked seeds.
15. Of herbs that are bacciferous or pomiferous.

16. Of herbs with bulbous roots, those of their [illegible]red, and of herbs with flowers, that have six or more petala or coloured leaves.
17. Of herbs whose flowers are composed of several flowers.

To the introduction are attached eleven plates of shells, crabs, &c. and a map, and to the body of the work one hundred and thirty-four plates of plants, they are all double folio, mounted on guards in the centre, and are executed by Michael Vandergutcht, in the best style of that period, and are a proof of the wealth and munificence of the author.

It was not till 1725 that Sir Hans had leisure to put the second volume to press, though the greater part of the plates for it were engraved at the time the former appeared; having, says he, "a multiplicity of business in the practice of physic, which I esteem one of my first cares, and must be minded if the lives of persons be regarded with due attention to the several symptoms and changes of their diseases." He acknowledges the favours he had received from the king in the following dedication to George I.

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TO HIS MOST EXCELLENT MAJESTY,
THE KING;
THIS SECOND VOLUME OF THE
NATURAL HISTORY OF JAMAICA,
ONE OF
THE LARGEST AND MOST CONSIDERABLE
OF
HIS MAJESTY'S PLANTATIONS
IN
AMERICA,
IS, WITH ALL HUMILITY DEDICATED,
AS A TESTIMONY OF HIS DUTY AND GRATITUDE
FOR THE MANY GREAT BLESSINGS
WHICH HE WITH OTHERS ENJOY,
UNDER HIS MAJESTY'S WISE GOVERNMENT
AND POWERFUL PROTECTION;
AND FOR SEVERAL PARTICULAR INSTANCES
OF HIS MAJESTY'S FAVOURS CONFERRED ON
HIS MAJESTY'S MOST OBEDIENT,
MOST DUTIFUL,
AND MOST FAITHFUL
SUBJECT AND SERVANT,
HANS SLOANE.

There is an introduction of eighteen pages in vindication of those parts of the catalogue which had been attacked by Plukenet* in his Mantissa.

* Leonard Plukenet was a celebrated botanist, who, like his contemporaries Sloane and Petiver, practised medicine, but whether as a physician or apothecary is not known, but probably the latter; at all events, he never attained to any eminence in his profession, which appears to have excited his jealousy against them, who were both in high estimation and flourishing circumstances, particularly as, according to Sir J. E. Smith's opinion, in botanical science he "was apparently a man of more solid learning than either of those distinguished writers; and, having been less prosperous than either, he was

He then resumes his Natural History, which, with the index, occupies four hundred and ninety-nine pages, commencing with the trees of Jamaica. We shall exhibit an analysis of this volume.

CHAPTER 1. Of trees which bear their flowers and fruit separated.

2. Of trees bearing dry fruits which are not siliquose.

3. Of trees that have papilionaceous flowers, and are siliquose.

4. Of trees which bear berries, and are umbilicated or caliculated.

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perhaps less disposed to palliate their errors. As far as we have examined, his remarks, however severe, are not unjust." Linnæus's opinion of him may be formed from the following observations to Haller: "Who has ever been free from botanical errors? He is a wise man who can distinguish good from evil; and that general may be esteemed happy, who conquers and disperses his enemies with the loss of half his own forces. Who is more meritorious in exotic plants, though not a systematist, than Plukenet? but who was ever more unprincipled, more of a heretic in botany, or a greater scandal to our science, than either Plukenet or Vaillant?" The full title of the work mentioned above, is "Almagesti Botanici Mantissa, Plantarum novissime delectarum ultra Millenarium Numerum complectens," 1700, 4to.

The Herbarium of Plukenet consisted of eight thousand plants, an astonishing number to be collected by a private and not opulent individual. It came, after his death, into the hands of Sir Hans Sloane, and is now in the British Museum.—Biographical Dictionary by Chalmers, article Plukenet.

5. Of trees which bear berries, that are neither umbilicated or caliculated.
6. Of pruniferous trees, or such as bear plumbs.
7. Of pomiferous trees, or such as bear apples.
8. Of woods, fruits, rosins, &c.

On this chapter he makes the following observation: — "The several things described in this division, are such as I know very imperfectly, — only so far as they are made use of in Jamaica to the purposes hereafter recited. I am apt to suspect that some of them may be before taken notice of, and that I have not known them to be the vegetables put to those uses here mentioned." This chapter concludes the First Book, or botanical division of the work.

The Second Book commences with the account of Insects, which he prefaces with this just remark, — "The power, wisdom, and providence of God Almighty, the Creator and Preserver of all things, appear no where more than in the smallest animals called insects, which are provided with such senses as are necessary to bring them, through their several changes, to perfection: and notwithstanding their little bodies, and many enemies in every state, they are enabled to live, thrive, and propagate their kind, so that, since we have any exact history of them, none seem to be lost." He arranges them under the following division:

CHAPTER 1. Of such as suffer no change in their forms, and have no feet.
2. Of insects which are commonly believed to suffer no change in their forms, and have six or more feet.
3. Of libellæ, perlæ, or adderbolts, wild bugs, locusts, and crickets.
4. Of beetles.
5. Of erucæ, aureliæ, or coffins, butterflies, and phalenæ, or moths.
6. Of insects with membranaceous wings, as ants, bees, wasps, flies, and gnats.

The Third Book treats of Testaceous Animals, and is thus divided:

CHAPTER 1. Of land and river shells.
2. Of patellæ or limpets.
3 Of tubuli vermium.
4. Of conchæ veneris.
5. Of nerits.
6. Of sea snails and trochi.
7. Of buccinæ whose spiræ are short.
8. Of buccinæ whose spiræ are longer and smooth.
9. Of buccinæ whose spiræ are long and muricated.
10. Of the coverings for the mouths of some unknown shells.
11. Of bivalve shells, and first of the pinna and spondyls.
12. Of scallops and cockles.
13. Of oysters, muscles, and pholades.
14. Of tellinæ and chamæ.
15. Of multivalves.
16. Of echini marini, sea urchins or sea eggs.

Book the Fourth contains "Crustaceous Animals, Sea-stars, and Blubber." It is divided into three chapters, one for each head.

Book the Fifth, embraces the "Fishes of Jamaica," and is prefaced with this apology: "My being six miles every way from the sea, the heat of the air making fishes soon putrify here, and my other affairs, have made my observations of this kind very imperfect." This is his arrangement.

CHAPTER 1. Of long cartilaginous, and plain flat fish.
2. Of the eel.
3. Of fishes with rounder or contracted bodies.
4. Of fishes which are smooth and have one fin on their backs.
5. Of fishes which are smooth and have two fins on their backs.
6. Of fishes which are prickly and have one fin on their backs.
7. Of fishes which are prickly and have two fins on their backs.

The Sixth Book is devoted to the "Birds of Jamaica." "It is a common opinion," he remarks, "that the hot parts of the world abound most with birds of fine coloured feathers, and that they want those who sing. The first of which is true, and the latter false, for there are many sweet singing birds to be found here, and those of as pleasant notes as any in Europe." He makes but three chapters or divisions of them. "*First*, Of

land birds. *Second*, Of birds which wade or frequent watering places; and *Third*, Of water fowl, or such as are web-footed and swim."

The Seventh Book is also divided into three chapters.

1. Of the larger quadrupeds, that are whole and cloven footed.
2. Of quadrupeds which are oviparous, or lay eggs.
3. Of serpents.

The Eighth and last Book treats "Of the stones, earths, sands, minerals," &c.

There are one hundred and thirty-nine plates to this volume, consisting of plants, insects, shells, fish, and birds; the two volumes containing two hundred and eighty-five plates, besides the map.

"To the curious botanist," says Dr Pulteney, it will be observable, that out of eight hundred vegetables described in these volumes, above one hundred are ferns; and that of the others, more than two hundred and fifty species are of the arborescent kind. Subsequent voyagers have established it as a fact, that in the warmer and intertropical regions, this latter class constitutes, in a general way, the third part of the vegetable productions of nature. Abundantly the reverse of this takes place in temperate and cold climates." "In these volumes, Sir Hans has introduced all his quotations at length, from the books of travels mentioned in the 'Catalogue,' to illustrate the

various uses of each vegetable. They exhibit a proof of the author's veracity, which I conceive it is difficult to parallel in any other work." "The voyage of Dr Sloane was productive of much subsequent benefit to science, by exciting an emulation both in Britain and on the Continent. Sir Arthur Rawdon, upon viewing his splendid collection, sent James Herbert, a skilful gardener, to Jamaica, who returned with a ship almost laden with plants, in a vegetating state, and with a great number of dried specimens. Of the latter, Sloane had all such as were new, before he published his first volume. Many of the living plants succeeded in the garden of Sir Arthur, at Moyra, in Ireland; and many were distributed into the garden of the Bishop of London, at Fulham, Dr Uvedales at Enfield, the Chelsea garden, and especially that of her Grace the Duchess of Beaufort, at Badminton, in Gloucestershire; the botanic gardens of Amsterdam, Leyden, Leipsic, and Upsal, shared these varieties. Tournefort sent Dr Gundelscheimer, his associate in his oriental journey, into England, to view Sloane's plants, and this gave occasion to Plumier's expedition into the Caribbee Islands."*

Sir Hans Sloane was ever ready to promote the interests of science, by his purse and his

* Pulteney's Origin and Progress of Botany, vol. ii. pp. 79—81.

exertions. He advanced £700 to the College of Physicians, which he allowed to be paid off by instalments; and in 1721, he made the same society a present of £100. The same year, (having become lord of the manor of Chelsea, by purchase, in 1712,) he gave to the Company of Apothecaries the freehold of their botanical garden there, upon the sole condition, that they should present yearly to the Royal Society, fifty new plants, grown in the garden, till the number should amount to 2000, and pay a quit rent of £5 per annum, which was cheerfully accepted; and the number, of course, was completed in the year 1761, but the practice was continued till 1773, at which time 2550 were completed. Catalogues of them were published annually in the Philosophical Transactions. Sir Hans also contributed largely towards the expenses of the hot-houses and other necessary erections. In testimony of their respect for him, the Company, in 1733, erected in the centre of the garden, a marble statue executed by Rysbrach, representing him in a full bottomed wig and doctor's gown. On the pedestal is a Latin inscription, commemorating his donation, and the design and advantage of it.*

* Hansio Sloane, Baronetto. Iatro Insignissimo Botanices Fautori, Hoc honoris ca Monumentum Inque perpetuum ejus Memoriam Sacrum, voluit Societás Pharmacopeiorum, Londinensis, 1733.

Upon the death of Sir Isaac Newton, in 1727, Sir Hans was elected President of the Royal Society, having previously served the office of Vice-President. To this Society he had ever liberally contributed; besides a hundred guineas, he presented them with a bust of King Charles the Second, and is said to have been instrumental in procuring Sir Godfrey Copley's benefaction of a medal; and when, at the age of eighty, he begged to retire from so arduous an honour, in 1740, the Society entreated his permission, as a mark of respect for his eminent services, that they might continue his name on the list of their council as long as he should live.

Of his numerous charities it is difficult to give an idea. He was a governor of most of the London hospitals, a liberal benefactor to them during his life, and left them considerable legacies at his death. To the poor he was uniformly a considerate and attentive friend, assisting them with money, and prescribing for them in sickness, even after he had retired from public life to his house at Chelsea. To foreigners he was extremely courteous; and kept an open table once a-week for his learned friends, particularly the Members of the Royal Society.

But it is his Museum with which we have more to do. From a very early period, he appears to have commenced forming it. His collections

during his West Indian voyage were the nucleus. The earliest notice of it occurs in Evelyn's Diary, who, under the date of April 16, 1691, mentions, —"I went to see Dr Sloane's curiosities, being a universal collection of the natural productions of Jamaica, consisting of plants, fruits, corals, minerals, stones, earth, shells, animals, insects, &c. selected with great judgment; several folios of dried plants, and one which had about eighty several sorts of ferns, and another of grapes; the Jamaica pepper, in branch, leaves, flower, fruit, &c. This collection, with his journal and other philosophical discourses and observations, is indeed very copious and extraordinary, sufficient to furnish a history of that island, to which I encouraged him." It received its first, and perhaps principal increase, however, in 1702, upon the death of his friend Mr Courten, who, we have seen, bequeathed his extensive and valuable museum to Sir Hans, upon condition of his paying certain legacies specified in his last will. What was the precise state or value of this accession, we have no means of knowing,* as there exists no separate catalogue of its contents. The Biographical Dictionary, indeed, informs us, that there are MS. catalogues which, "swelled with short histories and accounts of their contents, amount in all to thirty-eight

* We have seen it estimated at £8000, both by Evelyn and Thoresby. See p. 4, 5.

volumes in folio, and eight volumes in quarto."* But these catalogues were stated, at the time of Sloane's death, to be those of the *whole* museum as then existing; and we know that, from many other sources, Sir Hans obtained augmentations; and the account he himself gives of it after the purchase of Petiver's collections, compared with that published immediately after his death, will shew that it was constantly increasing.

Apologizing in 1725 for the delay in publishing the second volume of his Natural History of Jamaica, he says — "The putting into some kind of order my curiosities, numbering them and entering their names, and accounts received with them, in books, which was necessary in order to their preservation and uses, hath taken me up some of the time I have had to spare from the exercise of my profession; and because some people have represented me careless and negligent in not giving this second volume sooner, I think it proper, in my own justification, to acquaint the reader, that I have entered into books, and numbered these natural and artificial things following."

The numbers in the first columns are those he there gives; those in the second column, are from the list as transmitted to the British Museum after his death.

* Article COURTEN, vol. x. p. 363.

	1725	1753
Earths and salts, ...	536	1035
Bitumens, sulphurs, ambers, ambergrise,	249	399
Metals and minerals . . .	1394	2725
Talcs, micæ, &c.	169	388
Crystals and spars, or fluores crystallini,	1025	1864
Flints, stones, and other remarkable fossils that are anomalous, .	730	1275
Precious stones, agates, jaspers, and fine marbles, ...	1394	2256
Corals, or such as are akin to them, as sponges, and other submarine plants,	804	1421
Vegetables, and vegetable substances, as roots, woods, fruits, seeds, gums, resins, and inspissated juices,	8226	12,506
Besides two hundred large volumes of dried samples of plants, amongst which are such specimens as were collected by myself in Europe, the Madeira Islands, and America; as also, those gathered by Dr Merret, Dr Plukenet, Mr Petiver, and other curious persons all over the known world, ...	200	334
Insects, ...	3824	5439
Testacea or shells, and their parts, both natural, found at sea and land, and fossil, ...	3753	5843
Echini, or sea urchins, and parts of them, both natural and fossil, found at sea and land, ...	486	659
Crustacea, or crabs, lobsters, &c. .	263	363
Fishes and their parts, . . .	1007	1555

	1725	1753
Asteriæ, trochi, entrochi, &c.	183	241
Birds and their parts,	568	1172
Eggs,	185	
Quadrupeds and their parts,	1194	1886
Vipers, serpents, &c.	345	521
Humana, namely, stones of the kidneys and bladder, anatomical preparations, and the like,	507	756
Miscellaneous things, not comprehended with the foregoing, both natural and artificial,	1169	2098
Things relating to the customs of ancient times or antiquities, urns, instruments, &c.	302	1125
Large seals,	81	268
Pictures, many relating to Natural History,	319	471
Mathematical instruments,	54	55
Large vessels, handles, and other things made of agate, jasper, cornelian, crystals, besides many camei and seals, excisa et incisa.	441	542 and cameos 700
Medals, ancient, as Samaritan, Phœnician, Greek, Consular, Roman, &c. and modern; and coins in all metals,	20,228	23,000
Books in Miniature or colours, with fine drawings of plants, insects, birds, fishes, quadrupeds, and all sorts of natural and artificial curiosities,	136	These three heads, with his printed books, estimated at 50,000
Books of prints, &c.	580	
Volumes of manuscripts, the greatest part of them relating to physic and natural history, travels, &c.	2666	

From the above comparative statement of its treasures in the years 1725 and 1753, it will easily be perceived that Sir Hans Sloane himself most materially increased every department of this magnificent collection. In January, 1741, he commenced removing them, together with his library, from his house in Bloomsbury, to that at Chelsea; and having entirely completed the transfer by May following, he retired thither to enjoy the remainder of his life among his books and scientific treasures, and the society of the learned. Here, in 1748, he was honoured with a visit from their Royal Highnesses the Prince and Princess of Wales, the father and mother of King George III. of which the following account was given at the time, which affords additional particulars of the state and arrangements of the museum. "Dr Mortimer, Secretary to the Royal Society, conducted the prince and princess into the room where Sir Hans was seated, being ancient and infirm. The prince took a chair, and sat down by the good old gentleman for some time, when he expressed the great esteem and value he had for him personally, and how much the learned world was obliged to him, for his having collected such a vast variety of curious books, and such immense treasures of the valuable and instructive productions of nature and art. Sir Hans's house formed a square of about one

hundred feet on each side, enclosing a court, and three front rooms had tables set along the middle, which were spread over with cases filled with all sorts of precious stones, in their natural beds or state, as they are found in the earth, except the first, that contained stones formed in animals, which are so many diseases of the creature that bears them; as the most beautiful pearls, which are but warts in the shell-fish, the bezoar, concretions in the stomach, and stones generated in the kidney and bladder, of which man wofully knows the effects; but the earth, in her bosom, generates the verdant emerald, the purple amethyst, the golden topaz, the azure sapphire, the crimson garnet, the scarlet ruby, the brilliant diamond, the glowing opal, and all the painted varieties with which Flora herself might wish to be decked; here the most magnificent vessels of cornelian, onyx, sardonyx, and jasper, delighted the eye, and raised the mind to praise the great Creator of all things."

"When their royal highnesses had viewed one room, and entered another, the scene was shifted; for when they returned, the same tables were covered for a second course, with all sorts of jewels, polished and set after the modern fashion, or with gems carved or engraved, the stately and instructive remains of antiquity. For the third course, the tables were spread with gold and

silver ore, with the most precious and remarkable ornaments used in the habits of men from Siberia to the Cape of Good Hope, from Japan to Peru, and with both ancient and modern coins, and medals in gold and silver, the lasting monuments of historical facts ; as those of a Prusias, king of Bythinia, who betrayed his allies ; of an Alexander, who, mad with ambition, overran and invaded his neighbours ; of a Cæsar, who enslaved his country, to satisfy his own pride ; of a Titus, the delight of mankind ; of a Pope Gregory the XIII. recording, on a silver medal, his blind zeal for religion, in perpetuating thereon the massacre of the Protestants in France, as did Charles IX. the then reigning king in that country. Here might be seen the coins of a king of England, crowned at Paris, a medal representing France and Spain striving which should pay their obeisance to Britannia ; others shewing the effect of popular rage when overmuch oppressed by their rulers, as in the case of the De Wits in Holland, the deliverance of Britain by the arrival of William, the glorious exploits of a Marlborough, and the happy sway of the present royal family."

"The gallery, one hundred and ten feet in length, presented a most surprising prospect. The most beautiful corals, crystals, and figured stones, the most brilliant butterflies and other insects, shells painted with as great variety, as the precious

stones, and feathers of birds vying with gems. Here the remains of the world, before the Deluge, excited the awful idea of that catastrophe; and are so many evident testimonies to the truth of Moses's history."

"Then a noble vista presented itself through several rooms filled with books, and many hundred volumes of dried plants; a room full of choice and valuable manuscripts; the noble present sent by the French King to Sir Hans, being prints of his collection of paintings, medals, statues, palaces, &c. in twenty-five large atlas volumes, besides other valuable things, too numerous to mention here."

"Below stairs, some rooms were filled with curious remains of antiquities, from Egypt, Greece, Etruria, Rome, Britain, and even America; others with large animals preserved in the skin; the great saloon lined on every side with bottles filled with spirits, containing various animals. The halls were adorned with the horns of various creatures, as of the double horned rhinoceros of Africa, and deers' horns from Ireland, nine feet wide, and with weapons of different countries; among which it appears, that the Mangalese, and not our most Christian neighbours, the French, had the honour of inventing that butcherly weapon, the bayonet. Fifty volumes in folio would scarcely suffice to contain a detail of this immense museum, consisting of ove two hundred thousand articles.

" Their royal highnesses were not wanting in expressions of their satisfaction at seeing a collection which surpassed all the notions or ideas they had formed of it, from even the most favourable accounts. On this occasion the prince shewed his great reading and happy memory; for in such a multiplicity and such a variety of the productions of nature and art, upon any thing being shewn to him that he had not seen before, he was ready in recollecting having read of it; and upon viewing the ancient and modern medals, he made so many judicious remarks, that he appeared to be a perfect master of history and chronology. He expressed the great pleasure it gave him to see so magnificent a collection in England, esteeming it an ornament to the nation; and expressed his fixed sentiment, how much it must conduce to the benefit of learning, and how great an honour will redound to Britain, to have such a grand repository established for public use to the latest posterity."*

Amidst these tranquil occupations, he attained an age far beyond the period assigned by the Psalmist to those very few " who, by reason of their strength," exceed, though " in labour and sorrow," man's allotted portion of existence, and this, without these painful concomitants, even to the ninetieth year of his age. From that time,

* Letter of Dr Mortimer in Gentleman's Magazine, July, 1748.

however, he became sensible of a gradual decay, and his friend, George Edwards, the naturalist, has left us the following interesting but distressing narrative of his latter days. "Sir Hans Sloane employed me for a great number of years in drawing miniature figures of animals, &c. after nature, in water colours, to increase his very great collection of fine drawings by other hands; which drawings are now all fixed in the British Museum, for the help and information of those in future generations, that may be curious or studious in natural history. Sir Hans in the decline of life left London, and retired to his manor-house at Chelsea, where he resided about fourteen years before he died. After his retirement to Chelsea, he requested it as a favour to him, (though I embraced his request as an honour done to myself,) that I would visit him every week, in order to divert him, for an hour or two, with the common news of the town, and with any thing particular that should happen amongst his acquaintances of the Royal Society, and other ingenious gentlemen, many of whom I was weekly conversant with; and I seldom missed drinking coffee with him on a Saturday, during the whole time of his retirement at Chelsea. He was so infirm, as to be wholly confined to his house, except sometimes, though rarely, taking a little air in his garden in a wheeled chair; and this

confinement made him very desirous to see any of his old acquaintance to amuse him. During this latter part of his life, he was frequently petitioned for charity by some decayed branches of families of eminent men, late of his acquaintance, who were famous for their learned works, &c. which petitions he always received, and considered with attention; and provided they were not found fraudulent, they were always answered by his charitable donations. He has often desired that I would inquire into the merits of such petitions; and if found satisfactory, he commissioned me to convey his bounty to the distressed. The last time I saw him, I was greatly surprised and concerned to find so good a man in the agonies of death. This was on the tenth day of January, 1753, at four o'clock in the afternoon. He died on the eleventh, at four in the morning, being aged ninety-three years. I continued with him later than any one of his relatives, but was obliged to retire — his last agonies being beyond what I could bear; though under his pain and weakness of body, he seemed to retain a great firmness of mind, and resignation to the will of God." *

Sir Hans had married, in 1695, Elizabeth, daughter of Alderman Langley, of London. She died in 1724, and was buried at Chelsea, where, on the 18th of January, 1753, her husband's body

* Essays upon Natural History, 8vo. 1770, pp. 122, 124.

was deposited in the same vault with her. A monument was erected to their memory, consisting of a pedestal, surmounted by a portico, which is supported by four pillars, under which is an urn, entwined with serpents, emblematical of his profession, with the following inscription:— "In memory of Sir Hans Sloane, Bart. President of the Royal Society and of the College of Physicians, who died in the year of our Lord 1753, the ninety-second year of his age, without the least pain of body, and with a conscious serenity of mind ended a virtuous and beneficent life. This monument was erected by his two daughters, Elizabeth Cadogan and Sarah Stanley." On the north side of the monument is a memorial of Lady Sloane.*

In conformity with the custom of the time, a funeral sermon was preached by Dr Zachary Pearce, at that time Bishop of Bangor, but who had been expressly forbidden by the deceased to give way to the gross flatteries so prevalent on such occasions, Sloane very properly accounting it a degree of profanation to debase with the praises of human excellencies that pulpit which should be devoted to display to men the attributes of the Deity, and to instruct them in his laws.

* "Here lies interred Elizabeth Lady Sloane, wife of Sir Hans Sloane, Bart. who departed this life in the year of our Lord 1724, and the 67th of her age.

Two daughters only survived Sir Hans Sloane, a son and a daughter having died in their infancy, Sarah, the eldest, was married to George Stanley, Esq. of Poulton, in Hampshire,* and Elizabeth married Lord Cadogan. Unwilling to deprive these ladies of so large a portion of his fortune, and yet reluctant to have his museum divided after his death, and equally reluctant to deprive his country of the benefit of so valuable a collection, Sir Hans, by his last will, bequeathed this magnificent result of the exertions of his whole life to the nation, on condition that Parliament should reimburse his family to the extent of £20,000, a sum, though large, said to be "not more than the intrinsic value of the gold and silver medals, ores, and precious stones in it;" and he himself states in his will, that the first cost to him had been at least £50,000. In consequence of this, immediately after his death,

* Mrs Stanley left one son and two daughters. Hans, the son, died January 13, 1780, at Althorp, the seat of Earl Spencer. He was a Lord of the Admiralty from 1757 to 1763. In 1761 he was appointed Charge des Affaires at Paris; and, in 1765, was sent ambassador extraordinary and plenipotentiary to the Empress of Russia; and, in 1766, he was appointed Cofferer of the King's household. He was many years M.P. for Southampton.

Anne, his eldest sister, was married to William Ellis, Esq. created Lord Mendip; and Sarah became the wife of Christopher d'Oyley, Esq. who died January 19, 1795, aged 87.

"above forty of the trustees, appointed by the will to take charge of his museum, met the Lord Cadogan, and the other executors, at the manor-house, Chelsea. His lordship produced the will, and acquainted the trustees with the codicils, containing the dispositions for continuing his collection together at Chelsea, and for giving a small part of its value to his family; and, for that purpose, to make an offer of the said museum to the King or to the Parliament of England, for £20,000, to be paid to the family; and if the same was accepted, and continued at Chelsea, to give the manor-house and lands at Chelsea, with the museum as it is now disposed, which would save the expense and hazard of removing the same; and to be kept open at proper hours for the access of the studious and curious. Then Mr Sloane acquainted the trustees, that, the executors being apprehensive of danger, the medals of gold, silver, and some curious copper coins, and the precious stones, such as pearls, rubies, emeralds, &c. and the vases of gems, &c. had been removed, for safety, to the Bank of England; and that two of the executors had seen them all packed up. The Earl of Macclesfield having been desired by the trustees to take the chair, the will and codicils were read. An account, also, of the nature and value of the museum, and an abstract of the

articles it contained, was read by Mr James Empson, who had taken care of the museum for many years past, and was then appointed secretary to the trustees. Sir George Lyttleton then moved, and Mr West seconded, that a memorial should be presented to his Majesty relating to this matter; and a committee was appointed to draw up the same."*

The result was, that Parliament immediately closed with the offer; and, in 1753, an act was passed, entitled, "An Act for the purchase of the Museum or Collection of Sir Hans Sloane, Bart. and of the Harleian collection of MSS. and for procuring one general repository for the better reception and more convenient use of the said collection, and of the Cottonian library in addition thereto."

By this act, the sum of £100,000 was ordered to be raised by a lottery, and certain great officers of state, together with private individuals as representatives of the families of the principal contributors, and others, were incorporated by the name of "Trustees for the British Museum."†

* Gentleman's Magazine, January, 1753.

† The Government of the British Museum is at present vested in forty-eight trustees, of whom twenty-three are *ex-officio*, nine are representatives of the families of Sloane, Cotton, Harley, Townley, Elgin, and Knight; one is appointed by the King, and fifteen are elected. The

The first act of these trustees was to provide a proper building for the reception of the collections confided to their care; and, after various proposals, they at length fixed upon the mansion built, about the year 1680, by Ralph, first Duke of Montague, who, being at that time ambassador

official Trustees are, the Archbishop of Canterbury, Lord Chancellor, Speaker of the House of Commons, Lord President of the Council, First Lord of the Treasury, Lord Privy Seal, First Lord of the Admiralty, Lord Steward, Lord Chamberlain, three principal Secretaries of State, Bishop of London, Chancellor of the Exchequer, Lord Chief Justice of the King's Bench, Master of the Rolls, Lord Chief-Justice of the Common Pleas, Attorney-General, Solicitor-General, President of the Royal Society, President of the College of Physicians, President of the Society of Antiquaries, and President of the Royal Academy.

The present Trustees or Representatives of the Sloane family are the Earl of Cadogan and (vacant.)

The Regulations for the inspection of the Museum, are as follows:—

"The Museum is kept open for public inspection every Monday, Wednesday, and Friday, in every week, except in the Christmas, Easter, and Whitsunday weeks; on the 30th of January, Ash Wednesday, Good Friday, the 5th of November, and any Fast or Thanksgiving day that may occur, and likewise during the month of September.

"Persons who may wish to see the Museum, are to apply in the anteroom of the house, between the hours of ten and two, where their names, and the number of the friends they may wish to introduce with them, are inscribed in a book kept for the purpose, upon which admission will be granted."

at Paris, sent over French artists for erecting and adorning the edifice he had in contemplation. This palace, together with its gardens and appurtenances, occupying in the whole an area of seven acres and twenty perches of land, was ceded by the representatives of the Montague family for the moderate sum of £10,000. The necessary repairs (which, the house having stood long empty, proved very expensive) were immediately proceeded upon; and the proper bookcases and cabinets having been completed, and the collections removed thither, the museum was at length opened for study and public inspection, January 15, 1759. The sum actually netted by the profits of the lottery under the Act of Parliament, was £95,194, 18s. 2d. which was expended in the following manner:—

Paid for the Sloanean collection,	£20,000	0	0
for the Harleian,	10,000	0	0
for Montague House,	10,000	0	0
Laid out in the purchase of £30,000, three per cent reduced annuities, &c. appropriated to the maintenance of the establishment,	28,663	15	0
Repairs, cases, furniture, removing, and incidental expenses,	26,531	3	2
	£95,194	18	2

From that time to the present, it has been gradually extended and increased by donations, bequests, and purchases — but to trace the progress of this increase belongs not to this work. It has very recently been newly arranged and considerably improved in every respect ;* and a very copious and interesting account of its present state may be obtained from the twenty-eighth edition of the "Synopsis of the Contents of the British Museum," published in 1834.

We have already alluded to Sir Hans Sloane's contributions to the Philosophical Transactions. We shall enumerate the titles of those papers connected with zoology.

An account of the bird called the Condor of Peru, from the relation of Captain Strong, who had met with one on the coast of Chili, which measured sixteen feet from tip to tip of the wings. Vol. 18.

* As an evidence of the increasing taste for Natural History among the public at large, it may be noticed, "that the number of visiters to the collections of natural history in the British Museum amounted, in the year 1810, to 15,000. The year following, upon the mode of admission being changed, the number was doubled; and it has since that time constantly increased, amounting, in 1818, to above 50,000, and, in 1824, considerably exceeding 100,000."—Quarterly Review, vol. 34, p. 158. We have no means of ascertaining the numbers since that date, but have no doubt they have gone on increasing in at least the same proportion.

An account of the Fossil Tongue of a *Pastinaca Marina*, (*Raia Pastinaca, Lin.*) dug up in Maryland; with a comparison of it with the recent tongues of the Thornback. Illustrated with many figures. Vol. 19.

An account of a pair of very extraordinary large horns, found in a cellar at Wapping; with figures. Dr Hook suspected they were the horns of an animal described by Nieuhoff under the name of Sukotyro, as it is called by the Chinese. Sir Hans conjectures, they might belong to the *Taurus Carnivorus* of Agacharchides; of which he traces the history through the writings of the ancients; but thinks it very uncertain whether this is the same animal with the Sukotyro. Vol. 34.

An account of such specimens of Elephants' Teeth and Bones as are reposited in the museum of Sir Hans Sloane, with figures, vol. 35. Introductory to

Remarks on divers accounts of Teeth and Bones, found under ground, vol. 35.

Conjectures on the fascinating power attributed to the Rattle Snake, vol. 38.

Accounts of the pretended Serpent Stone, called Pietra de Cobra de Cabelos, and of the Pietra de Mombezzo, or the Rhinoceros Bezoars; with the figure of a Rhinoceros with a double horn, vol. 46.

Besides these, there are many papers on botanical and medical subjects, contained in the 17, 20, 21, 22, 23, 27, 40, 41, and 44th volumes, and, in the 49th, a very curious account of the introduction of Innoculation for Small Pox into England.

Sir Hans Sloane was also the cause of Dr Leonhart Rauwolf's "Journey into the Eastern Countries" being translated into English, of which he writes thus to Ray: "I have perused most part of Rauwolf's Voyage; which, being only extant in high Dutch, and that understood by very few, I thought would do very well in English, and so borrowed it from the Royal Society; and Captain Hatton, being desirous of it likewise, we put it into the hands of Mr Staphorst, who has done it, as you see, I think, pretty clear — though the making it good language and the notes are left wholly to you. Some passages are not to be well translated, because of different customs and proverbs; but I think, so far as the Natural History is concerned, it may be understood." * Accordingly, the book translated by Nicholas Staphorst, and improved by Ray, was published in the second volume of the work known by the title of "Ray's Travels," and reached a second edition in 1738.

Among the friends of Sir Hans, may be mentioned the names of Sydenham, Boyle, Evelyn, Ray, Lister, Edwards, and indeed all the aristocracy of talent in existence during his life. To have commanded the esteem and respect of such men, would reflect honour on any one. We have seen the affectionate memorial of him penned by Edwards, many years after his death; and Ray, while on his deathbed, addressed him in the following terms, being the last lines he ever wrote; "and which bear," says Dr Derham, "the marks of a dying hand in every letter."

DEAR SIR, — *The best of friends;* these are to take a final leave of you as to this world. I look upon myself as a dying man. God requite your kindness expressed any ways towards me an hundred fold. Bless you with a confluence of all good things in this world, and eternal life and happiness hereafter. Grant us an happy meeting in heaven. I am, Sir, eternally yours,

JOHN RAY.

Black Notley, Jan. 7, 1704.

Postscript,—When you happen to write to my singular friend, Dr Hotten, I pray tell him I received his most obliging and affectionate letter, for which I return thanks, and acquaint him that I was not able to answer it; or ———

Dr Derham adds, "his strength failing, as I perceive by his writing, (which was scarce legible in this postscript,) he was forced to break off abruptly."

In person, Sir Hans Sloane was tall and well made; in his manners, easy, polite, and engaging; sprightly in his conversation, and obliging to all.

Natural History has always been considered a pursuit favourable to the cultivation of religion and pure morality. To "lead through Nature, up to Nature's God," may be a hackneyed sentiment, but that very fact proves the connection; it has, however, unfortunately not been uniformly the case, and among the few memoirs we have already submitted to the reader, we have had instances that

> Our wayward intellect, the more we learn
> Of nature, overlooks her Author more;
> From instrumental causes, proud to draw
> Conclusions retrograde, and mad mistake.

But the life of Sir Hans Sloane exemplifies the very reverse of this: it is one we dwell on with pleasure, and record with pride; it proves that

> —— Philosophy, baptized
> In the pure fountain of eternal love,
> Has eyes indeed; and, seeing all she sees
> As meant to indicate a God to man,
> Gives him his praise, and forfeits not her own.

"To fear God and keep his commandments,"

"and to visit the fatherless and widows in their affliction," seems to have been his habitual practice throughout his long protracted existence. We have seen him born with a natural delicacy of constitution, which nothing, it is probable, but rigid temperance and self-denial could have sustained, yet cheerfully submitting to these restraints, while cultivating the abilities his Maker had bestowed upon him; we have seen him carry with him the good wishes and recommendations of his instructors, while pursuing his education in foreign countries; and, finally, brought into active life at home, under the auspices of men of high talent and reputation, whose kindness and judgment the result fully justified. His middle age was passed in active benevolence, alleviating "the evils that flesh is heir to," among all classes, from the sovereign on the throne, to the casual and dependant inmate of an hospital, receiving honours from the one, and blessings from the other; a generous promoter of every institution calculated to enlarge the mental powers of man or relieve his bodily infirmities; and, at length resigning his soul into the hands of the God who gave it with humility and resignation, and with admirable consistency so rarely practised, leaving directions that no sycophantic eulogy should be pronounced over his remains; but that the occasion should be improved by those salutary reflections which such

a spectacle was calculated to excite. Never were the vanity of all earthly blessings, the fragility of all earthly possessions, however connected with science, literature, and all that we are accustomed to consider as indicative of mental superiority,—never were the futility of such things *alone* more strikingly illustrated than in the present instance, "seeing that wise men also die and perish together, as well as the ignorant and foolish, and leave their riches to others." Blessed are they who, like Sir Hans Sloane, rate such pursuits at their real value, as preparatory to a higher state of existence, and who, like him, "having provided for their own," bestow their superfluities on the improvement of their fellow men. Such men are the "salt of the earth."

As a Naturalist, it is true we cannot place him in the highest rank; but as the patron of Natural History, the encourager of science, the promoter of every charitable work, he obtained the unanimous applause of his contemporaries, and deserves the grateful esteem and respect of posterity. As the founder of the British Museum, he merits the admiration of every one to whom the national progress in literature, science, and art is dear. If we rightly appreciate the advantages of an institution, calculated to foster a taste for those pursuits that elevate man above sensual appetites and sordid gain,—an institution, intended to assist the author,

the artist, and the philosopher, in their several studies,—an institution which, on the most liberal scale, is open to all who, from an enlightened curiosity, may wish to inspect, or for particular purposes to consult it,—if such an institution is valued in an age distinguished by its efforts to educate *all* classes, it is to Sir Hans Sloane the merit of it is due, — to him is owing not merely the respect of all who, like ourselves, are engaged in the promotion of the delightful study of Natural History, but the gratitude of the nation at large.

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APPENDIX.

WILL OF SIR HANS SLOANE.*

"I, Sir Hans Sloane, of the parish of St George, in Bloomsbury, in the county of Middlesex, doctor in physic and baronet, being in health of body and mind, (thanks be to God,) but having before me, more than most men, the great uncertainty of life: and having, by the blessing of God, acquired a considerable real and personal estate, requiring some law in the disposition of them, do make this my last will and testament.

"In the first place, I do very willingly resign my soul unto my almighty, merciful, and wise Creator, whenever it shall please him to remove me out of this troublesome life; not doubting the forgiveness of what failings or transgressions, either of omission or commission, through passions, inadvertencies, or otherwise, I may have been guilty of, and thereby offended God or man; firmly hoping for a better life hereafter; having earnestly besought God, in this dark and ignorant state, to direct my belief and actions according to his will, and endeavoured to inform my conscience, (as much as my necessary affairs and civil duties would give me leave,) and to conform my actions to it, and in doubtful cases striving to make this my rule, to do to others as I thought I should desire to be done to me in like circumstances.

"I will that my body shall be buried in a decent manner, in the church-yard, at Chelsea, about noon, or at a convenient time of the day. And I will that there be invited to my funeral all such persons as I

* We have been indebted to Faulkner's Historical and Topographical Description of Chelsea for this copy of the will.

shall leave in a list by me signed; or if no such list be left, then such persons as my executors shall know to have been my most intimate friends and acquaintances. And that they shall have rings of twenty shillings value given to each of them.

"Whereas, from my youth, I have been a great observer and admirer of the wonderful power, wisdom, and contrivance of the Almighty God, appearing in the works of his creation, and have gathered together many things in my own travels or voyages, or had them from others, especially my ever honoured late friend, William Courteen, Esq. who spent the greatest part of his life and estate in collecting such things in and from most parts of the earth, which he left me at his death, subject to several debts and legacies, which have been long since satisfied and paid, and his collections kept entire. And whereas I have made great additions of late years, as well to my books, both printed and manuscript, as to my collections of natural and artificial curiosities, precious stones, books of dried samples of plants, miniatures, drawings, prints, medals, and the like; with some paintings concerning them, now placed in my house and gardens; amounting in the whole to a very great sum of money, reckoning them at first cost to be at least fifty thousand pounds. Now, desiring very much that these things, tending many ways to the manifestation of the glory of God, the confutation of atheism and its consequences, the use and improvement of physic, and other arts and sciences, and benefit of mankind, may remain together and not be separated, and that chiefly in and about the city of London, where I have acquired most of my estates, and where they may, by the great confluence of people, be of most use. Now, I do give and devise the same unto Charles Lord Cadogan, my nephew William Sloane, Esq. and the Rev. Dr Sloane Elsmere, rector of Chelsea, whom I do make executors of this my last will and testament. Nevertheless, such my bequest and gift to them is upon this special trust and confidence, that they shall, as soon as may

be, after my decease, sell and dispose of the same, to be settled for the public uses aforesaid, at the rate of twenty thousand pounds of lawful money of Great Britain. And my will and desire is, that his Grace the Duke of Richmond, the Lord Cadogan, Sir Robert Walpole, Sir Paul Methuen, Mr Edgecomb, or any other proper persons I have the honour to be known to, who understand matters of this nature, and may have access to his most excellent Majesty, King George the Second, and are willing to promote so public a good, may be humbly desired to offer them to his Majesty, at the rate above mentioned, for the purposes aforesaid. But if his Majesty shall not think fit to accept of the same within six months after such overture made, then my will is, that they be offered, at the same price, to the President, Council, and Fellows of the Royal Society of London, for improving natural knowledge; and upon their refusal, to the Chancellor and Scholars of the University of Oxford; and upon their refusal, then successively to be offered to the College of Physicians at Edinburgh, the Royal Academy of Sciences at Paris, that at Petersburgh, Berlin, and Madrid, who have done me the honour to make me one of their members. And my will is that every one of them shall have one month's time, to be accounted from the time of the respective offer made to them; which offer or intention of mine may be signified to all, or any of them, for the acceptance of such offer, soon after my death. And in case none of the persons or public bodies aforesaid shall think fit to buy them at the price of twenty thousand pounds, then my will is, that my said executors do sell or dispose of them, either entirely to any person or body of men, or in parcels by auction, printed catalogues of them being timely dispersed; and that, in selling or disposing of them, and their catalogues or observations upon them, they take the advice of such persons as are skilled in natural knowledge, medals, &c. allowing him or them what my executors and they think reasonable for their care and trouble in perusing and correcting my catalogues, which have

been taken generally in great haste; I will, that the money arising by such sale be disposed of by my executors as hereafter is appointed and directed."

He then devises all that his Manor of Chelsea, with its rights, members, and appurtenances, and also all his lands, messuages, tenements, and hereditaments, in Chelsea, or elsewhere; and all other his estates of inheritance and personal whatsoever, together with the residue of his personal estate, to his aforesaid executors, upon the trusts following:—

"One third part of the said manor, and of all his messuages, &c. to the use of his eldest daughter, Mrs Stanley, and her assigns, and after her decease to her two daughters and their lawful issue, share and share alike, provided that the said daughters marry with the consent of their mother, or their guardian; and if not, then such share to go to the other sister. The other two-thirds of the manor, &c. to his youngest daughter Lady Cadogan, and to her heirs.

"In case either of his daughters die without issue, then the share of her so dying, to the survivor and her heirs; and in default of such issue of both his daughters, then the whole of the said Manor, &c. to his nephew, William Sloane, Esq. and his heirs; in default of such issue, to his neice, Lady Fowler, and her heirs, or to his Sister, Mrs Elsmere, and her heirs, successively.

"At the same time that I thus leave to my daughters, relations, and friends what I have, I earnestly recommend to them the practice of moral and religious duties, as being of greater use to them than any thing I can leave them, not only in the life to come, but even in this, by helping them through the difficulties of it, by more inward quiet, satisfaction and better health than otherwise, and with the esteem and respect of their friends and acquaintance.

"*Item.* I desire his Grace the Duke of Richmond to accept such live and rare animals as I may have at the time of my decease.

I, Sir Hans Sloane, of Chelsea, in the county of Middlesex, Bart. do make this codicil to be annext

to my last will and testament, as follows :— Whereas I have, in and by my will, given some directions about the sale and disposition of my museum, herein more particularly mentioned, now I do hereby revoke my will, as far as relates thereto ; and I do direct and appoint, concerning the same, in the following manner :— Having had from my youth a strong inclination to the study of plants, and all other productions of nature ; and having, through the course of many years, with great labour and expense, gathered together whatever could be procured, either in our own or foreign countries, that was rare and curious ; and being fully convinced that nothing tends more to raise our ideas of the power, wisdom, goodness, providence, and other perfections of the Deity, or more to the comfort and wellbeing of his creatures, than the enlargement of our knowledge in the works of nature, I do will and desire, that, for the promoting of these noble ends, the glory of God and good of man, my collection in all its branches may be, if possible, kept and preserved together whole and entire, in my manor house, in the parish of Chelsea, situate near the Physic Garden, given by me to the Company of Apothecaries, for the same purposes ; and having great reliance and confidence that the Right Honourable, Honourable, and other persons hereafter named, will be influenced by the same principles, and faithfully and conscientiously discharge the trust hereby reposed in them, I do give, devise, and bequeath, unto the Right Honourable Charles Sloane Cadogan ; Hans Stanley, Esq. ; William Sloane, Esq. ; the Rev. Sloane Elsmere, D.D. ; and the Rector of Chelsea for the time being, and certain other persons herein named ; all my museum at, in, or about my manor house, at Chelsea, aforesaid, which consists of too great a variety to be particularly described. But I mean all my library of books, drawings, manuscripts, prints, medals, and coins ; ancient and modern antiquities ; seals and cameos, intaglios and precious stones, agates, and jaspers ; vessels of agate, jasper, or crystal ; mathe-

matical instruments, drawings, and pictures; and all other things in my museum, which are more particularly described and numbered, with short histories or accounts of them, with proper references in certain catalogues by me made, containing 38 vols. in folio, and 8 vols. in quarto, except such framed pictures as are not marked with the word "collection." To have and to hold, to them and their successors, or assigns, for ever; to the intent only that the same, and every part and parcel of my museum, may be vested in the Right Honourable, and Honourable, and other persons, upon the trusts, and for the uses and purposes, and subject to the several limitations and directions hereafter particularly specified. And for the rendering this my intention more effectual, that the collection may be preserved and continued entire in its utmost perfection and regularity; and being assured that nothing will conduce more to this purpose, than placing the same under the direction and care of learned, experienced, and judicious persons, who are above all low and mean views, I do earnestly desire, that the King, His Royal Highness the Prince of Wales, His Royal Highness William Duke of Cumberland, the Archbishop of Canterbury, &c. will condescend so far as to act, and be visiters of my museum: and I do hereby, with their leave, nominate and appoint them visiters, with full power and authority for any five, or more of them, to enter my said collection, or museum, at any time, to peruse, supervise, and examine the same, and the management thereof, and to visit, correct, and reform, from time to time, as there may be occasion, either jointly with the trustees or separately, upon application to them for that purpose, or otherwise, all abuses, defects, neglects or mismanagements, that may happen to arise therein or touching or concerning the person or persons, officer or officers, that are or shall be appointed to attend the same; and my will is, and I do hereby request and desire, that the said trustees, or any seven or more of them, do make their humble appli-

cation to his Majesty, or to Parliament, at the next session after my decease, as shall be thought most proper, to pay the sum of £20,000 unto my executors, or the survivors of them, within twelve months after my decease, in consideration of the collection, or museum, it not being, as I apprehend or believe, a fourth of their real or intrinsic value; and also to obtain such sufficient and effectual means, powers, and authorities, for vesting in the trustees all and every part of my collection or museum before mentioned, in all its branches; and also my capital manor house, with such gardens and out-houses as shall thereunto belong, and be used by me at the time of my decease, in which it is my desire the same shall be kept and preserved. And, also, the water of or belonging to my manor of Chelsea, coming from Kensington, subject to furnishing or supplying the Lord Bishop of Winchester's house. And, also, all that the advowson, presentation, or right of patronage of the church of Chelsea; to the end the same premises may be absolutely vested in the trustees for the preserving and continuing my collection or museum, in such manner as they shall think most likely to answer the public benefit by me intended; and also obtain a sufficient fund or provision for maintaining and taking care of my collection and premises, and for repairing and supporting my manor house, water works, and premises, to be vested in the trustees for ever; and I do hereby farther direct and appoint that my executors do, upon payment of the sum of £20,000, deliver, or cause to be delivered unto the trustees, or any seven or more of them, for and in the name of all of them, in the presence of the visiters, or any five or more of them, as well as the possession of my manor house and gardens at Chelsea; as also my museum aforementioned and described, and every part thereof, in all its branches, whole and entire, as the same shall be found in my manor house, according to the said catalogues, and together with the several volumes of catalogues thereunto belonging; and, farther, my will is, and I do hereby also

direct and appoint, that, in case his Majesty, or the Parliament, do accept the offer, and do pay the sum of £20,000 unto my executors, or the survivors of them, that then my executors do, within six months after such payment as aforementioned, and obtaining proper powers for effectually vesting in the trustees all my collection, and my capital house and gardens, with their appurtenances, water, and advowson, presentation, or right of patronage of the church of Chelsea, together with my heir or heirs at law, and all other proper parties, do, and shall join in and execute such acts, deeds, and conveyances, as shall be thought requisite and necessary for the more perfect and absolute vesting, conveying, and assuring the premises, in and to the trustees, and their assigns and successors for ever, for the uses, intents, and purposes herein mentioned. And my will is, and I do hereby empower, that the trustees, or any seven of them, or more of them, do, and shall, in convenient time, after payment of the sum of £20,000 unto my executors, or the survivors of them, meet together, as often as shall be thought fit, and there make and establish, to be afterwards ratified and approved by the visiters hereby appointed, or any five or more of them, such rules and ordinances, and to make and appoint such officers and servants for the attending, managing, preserving, and containing of my museum and premises for ever, with such salaries, payments, or allowances, to them respectively, as shall seem necessary. And farther, my will is, and I do hereby order and direct, that, in case any difference or dispute shall happen to arise by or between the trustees touching the premises, which cannot be adjusted or settled among themselves; then, and in such case, and as often as the same shall happen, the visiters hereby appointed, or any five, or more of them, shall, and are hereby authorized and empowered to hear and determine, in the most summary way, such difference or dispute, whose order or determination shall be final. And it is also my will and desire, that all such other powers and authorities may be added

or vested, as well in the intended trustees, as in the visiters hereby appointed, as shall by the legislature be thought most proper and convenient for the better management, order, and care of my collection and premises. And farther, it is my will, and I do hereby declare and direct, that the advowson, presentation, and right of patronage of the church of Chelsea, shall be filled up from time to time, as often as the same shall become vacant, by such person or persons as the trustees hereby appointed, or the major part of them, shall nominate and appoint. And I do hereby declare, and it is my desire and intention, that my museum, or collection, be preserved and kept in my manor house, at Chelsea, aforesaid, by the said trustees and visiters, and that the same may be from time to time visited and seen by all persons desirous of seeing and viewing the same, under such statutes, directions, rules, and orders, as shall be made from time to time by the trustees, or any seven or more of them, to be afterwards ratified by the visiters, or any five or more of them, that the same may be rendered as useful as possible, as well towards the satisfying the desire of the curious, as for the improvement of knowledge, and information of all persons; and, for this purpose, I have hereby reposed a sincere trust and confidence in my Right Honourable, Honourable, and other trustees and visiters hereby appointed. In case the £20,000 should not be obtained as aforesaid, then the collection to be offered at the same rate to the Royal Academy of Sciences at Petersburg, the Royal Academy of Sciences at Paris, the Royal Academy of Sciences at Berlin, and the Royal Academy of Sciences at Madrid, successively. And if not disposed of as above mentioned, the executors then to sell or dispose of the same in the most advantageous manner; and the said manor house, advowson, &c. shall go to and belong to such person or persons, and in such manner as the rest of his said manors, lands, and tenements are devised to."

Dated July 10. 17 [illegible]

By another codicil, dated July 21, 1750, he bequeaths to his nephew, William Sloane, Esq. all his manor lands, &c. in Chelsea, in trust for Lady Cadogan, during her life; to his grandson, William Cadogan, Esq. for his life; and then to his great grandson, Charles Henry Cadogan, and his heirs, on condition of paying to Mrs Stanley £9000 over and above all that may be due to her at the time of his death.

And by another codicil, dated April 14, 1751, he revokes what he has given to Mrs Stanley, and bequeaths instead, all the residue of his personal estate that shall remain after payment of his debts, &c., and he appoints Mr James Empson one of his executors, and to have the care of the museum, as long as it shall remain unsold, with £100 per annum, over and above what he had already given him.

A farther codicil, dated September 22, 1751, revokes the former will and codicils, as far as they are inconsistent herewith, and bequeaths one moiety of the manor, &c. of Chelsea, unto Mrs Stanley, and her heirs, for ever; and the other moiety of the said manor, &c. to Lady Cadogan, and her heirs.

THE PACHYDERMES.

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It is proposed to devote the present volume to one of the Baron Cuvier's orders, which succeeds, and is very nearly allied to the last animals we treated of. It comprises creatures of great utility when domesticated, and of very remarkable form and structure.

The *Pachydermes* of Cuvier is evidently a group bearing only the rank of a tribe or family, and not of an order. It forms the seventh order of the Baron's system, followed by the Ruminants, with part of the orders *Bruta* and *Belluæ* of Linnæus; while, in the natural arrangement proposed by Mr Swainson, it is made to form a portion of his great

order *Ungulata*, or *Hoofed animals*, of which our present volume, with the two last, will give an idea of the typical forms; his other two divisions being composed chiefly of the extinct Pachydermous animals, and of the Sloths, Ant-eaters, and Ornithorynchus or the *Edentates* and *Monotremes*.

The *Pachydermes*, or thick skinned animals, so named from the strength and folded nature of their almost impenetrable hides, contain the largest land animals in creation. The Elephant, Rhinoceros, and Hippopotamus, belong to this group; the Mastodon, and all those huge wrecks of a former world, which for many years have engaged the speculations of the geologist, range under it;—immense herbivorous quadrupeds, living amidst the stupendous foliage of a vegetation proportionate to their bulk. At the present time, we find the members of this group inhabiting the warmer latitudes of Asia, Africa, and America; one individual extending in a wild state to Europe, and two or three, used economically, now nearly universally distributed by domestication. They frequent the retired forests and thick jungle, preferring such as are watered by some noble stream, where they can bathe and wallow during the hotter parts of the day. They are mostly herbivorous, and either feed on the foliage of peculiar trees, or upon the luxuriant herbage, which serves as an

undergrowth in these vast vegetable nurseries. In disposition they are rather timid and inoffensive, but when roused to attack or defend, possess the most revengeful temper, and rush to the onset with blinded fury. They are for the most part gregarious.

In form these animals are very bulky; unwieldy and clumsy in their proportions, yet possessing immense strength, and an activity beyond what would be supposed; and their pace, when they have fairly commenced it, from the length of stride, and the great propelling weight of their bodies, is for a time very rapid, and bears before it all ordinary obstacles, clearing a way through the thickest and most matted underwood. Their physiognomy is rather dull and inexpressive, partly occasioned by the peculiarity of the eye, which is, comparatively, remarkably small, *piggish* in appearance, and wanting in animation. When enraged, however, there is a degree of inexpressible ferocity and malevolence contained in their look, which is completely intelligible. Their skin is of great thickness, defending them from the attacks of insects, which would prove intolerable over so large a surface, and resisting the sharp spines of the brush, and staked points which they are liable to encounter in their path through the forests. It is often distributed in folds so strong as to resist the force of a leaden musket bullet,

and is in most instances nearly destitute of hair, except a few stiff stragglers about the head, shoulders, or end of the tail. In the Elephant, Rhinoceros, and Hippopotamus, where these characters are most strongly marked, the skin is thick and deeply furrowed; and the epidermis, which is also thick, is bristled upon the surface with little plates, which detach themselves from it like scales. The sole of the foot, according to Cuvier, presents a very singular structure. It is divided outwardly into nearly circular deep pits, in each of which are contained a number of small irregular polygones, which make the surface appear like a chagrined skin.*

The males are in most instances furnished with tusks, which often grow to an immense size and weight. Both jaws are sometimes furnished with these elongated teeth, which express the distinctive mark of the male, and are used as organs of offence or defence, being seldom employed, or indeed being scarcely fitted for assisting in any of the wants of the animal. It is from these organs that the ivory of commerce is derived. But the remarkable part of the structure of these animals is seen in that of the nostrils. In the greater portion of them they are elongated, the entrance of the nostrils forming a tube, which is used as

* Leçons d'Anatomie Comparée.

an organ of delicate prehension, of touch, and of smell,—a convenient apparatus for some of the more unwieldy, where their short neck would not enable them to stretch far above them, or even very easily to reach the ground. In these instances it serves the place of the flexible upper lip of some of the Ruminants, and the lengthened tongue of the Cameleopard. We find this structure most developed in the Elephant, whose elongated nostrils are familiarly known under the name of trunk or proboscis, and of whose structure we have entered more into detail in describing the Indian species. It will suffice to say here, that it is an organ of the utmost delicacy, in displaying the senses of smelling and touch, and at the same time capable of the most prodigious strength, and is constantly used by the animal in pulling within its reach the branches and foliage on which it feeds. The creatures which have it in the next greatest proportion elongated, are the Tapirs, in which the nostrils also are contained in a moveable snout, scarcely however used for prehension, but possessing great delicacy of smell and touch, and used in seeking out and discriminating their food. In the Rhinoceros the lip is elongated, but without being pierced by the nostrils; and in the Pigs we perhaps see the most industriously nosed quadrupeds, the lengthened form, and stiff pierced cartilage, serving as a powerful instrument to turn up the surface in search of insects, worm

and roots, while smelling and touch seems to guide to those which have been uprooted, the eye being seldom, if ever, used in discriminating their food.

The skeleton of the Pachydermes is necessarily of great strength, perhaps better expressed by the word massive. The immense weight of the head in most species renders a muscular apparatus of great power indispensable, and for this purpose there must be a large surface of insertion for the muscles. The head, by its extended surface gives attachment to those of the neck, which are the most powerful, not only for the support of the head, but to assist in the operations of digging, or employing the tusks or horn as a defence. "The processes of the cervical vertebræ are here more strongly developed, than in the long flexible neck of the Ruminantia, and the spinous processes of the dorsal vertebræ are lengthened, and strong, and generally terminated by round tubercles. The scapula is generally broader at its vertebral margin, and the strong pelvic arch is more vertical in its direction; the extremities are generally shorter and more massive, and the separate bones more completely formed, than in the former groups of quadrupeds. The ulna and the fibula being developed throughout, and four toes at least, generally reaching the ground on all extremities."* They are, as poetically

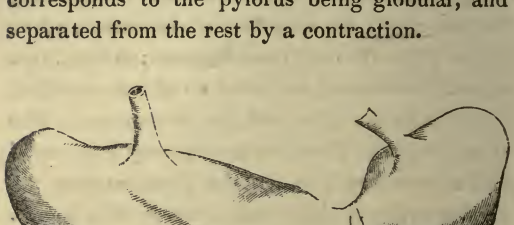
* Grant's Outlines, p. 105.

remarked by an eminent anatomist, like the Cyclopean walls of some ancient city, huge and shapeless, and piled over each other as if they were destined more to sustain the weight, than to permit motion. The strength and power of this frame-work will be better seen in the accompanying representation of the skeleton of the Rhinoceros, Plate I. taken from Cuvier's Ossemens Fossiles.

The internal structure of the Pachydermes is more simple than that of the Ruminants. Though they feed on nearly the same sort of sustenance, a few, as the Pigs, are nearly omnivorous; at least, in a domesticated state, they feed on almost any thing that is set before them, flesh, fish, or vegetables. The stomach of the Elephant is of a very lengthened and narrow form; its greatest diameter next the cardiac orifice is only about a fourth of its length. The internal membrane forms there thick wrinkles, and five large folds placed across, of which the first arises very near the cardiac orifice. This membrane is itself smooth, and is united in the middle part of the stomach; it only has some large transverse wrinkles towards the pylorus, which cross and intercept each other, often forming a number of small hollows. The muscular part is throughout very thick. There seems also to be a receptacle in the stomach of this huge beast, though in a much less extent than that of the Camel, to allow it to retain or secrete a supply of

water, which may be kept for the purpose of moistening its food, but at other times is made use of to disturb the insects, which, during a march, or in hot weather, annoy and torment it. This is effected by throwing out from its proboscis a quantity of water upon the part on which the flies fix themselves.

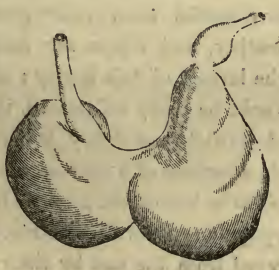
The stomach of the Rhinoceros is placed by Cuvier among those of simple construction. It is of a very lengthened form, the place which corresponds to the pylorus being globular, and separated from the rest by a contraction.



That of the Hippopotamus, again, is much more complicated, and is of a form and structure very singular. The cardiac orifice communicates with three pouches, of which only two appear exteriorly, and into a long bag or bowel, of which the cavity is transversely divided by many folds in the form of small valves. On the side of the last valve, the above mentioned bowel continues farther

lengthened, and is terminated by a narrow appendage, which is folded under it, and finishes at the pylorus. The internal membrane is all cleft, indurated and granular in the two largest pouches, and in the lengthened bowel, to the last valve, it is smooth and plaited. In the narrow appendage, it is not plaited, but the muscular membrane is very thick, particularly round the pylorus.

In the Pigs, the stomach is globular in form, very ample, and surmounted by an appendage like a hood; and in that singular little animal, which naturalists have agreed to place here, the Daman, or *Hyrax Capensis*, the stomach is separated into two distinct pouches, by a central partition, pierced with a hole in the centre. Each pouch answers to the right and left division in ordinary stomachs. The webs of the stomach are moderately thick, becoming more so round the pylorus, which is narrow and directed forwards.



The animals composing this group are not so conspicuous for their common utility as the ruminating animals. They, without doubt, hold their place in the balance of creation, lending their aid in the consumption of the vegetation of the Tropics; but the Elephants and Pigs are the only genera which have been subjected by domestication to be of direct use to man. Without the Elephant, we should be in much difficulty over all our eastern possessions; heavy baggage, or the accompaniments to an army, would be ill transported without his giant help, while in the more luxurious modes of travelling, and in the sports of the East, he is indispensable. Pigs are now almost universally bred and fattened, yielding an immense revenue, and serving to maintain in part our navy and large establishments. The Tapirs of America, though not hitherto used, are, from their mild temper and dispositions, thought capable of being trained as beasts of burden, and might prove useful from their great strength. Thongs, leather, and whips are made from the hides of the largest of this family; and the Cape colonist would be badly off indeed, in his rugged roads, and unwieldy weighty wagon, could he not provide a harness of a substance proportionate to the stress to be borne, and he finds it in the skins of the Hippopotamus and Rhinoceros, made limber and preserved from the sun by their own grease.

The value of ivory is well known; it is supplied principally from the tusks of the Elephant; and to obtain this small but valuable portion of these immense creatures, many personal risks are incurred, and great and indiscriminate slaughter is often made. The teeth of the Hippopotamus yield a closer grained and harder material than the tusks of the Elephant, and are preferred by dentists for artificial teeth, and for subjects which require great delicacy of carving. An immense quantity of ivory reaches China, and is again exported, carved into many beautiful and ingenious articles. We may also just mention the very useful, though common articles procured from other animals of the *Pachydermes*, — hog's lard and pig's bristles; nor should we neglect the beautiful and lustrous article, pig's hair, sometimes difficult to be procured, but always in high request by the angler.

We shall now examine the members of the different genera separately, and commence with

THE ELEPHANTS.

Calm amid scenes of havoc, in his own
Huge strength impregnable, the Elephant
Offendeth none, but leads a quiet life
Among his own contemporary trees,
Till nature lays him gently down to rest,
Beneath the palm which he was wont to make
His prop in slumber; there his relics lie
Longer than life itself had dwelt within them.
Bees in the ample hollow of his skull
Fill their wax citadels, and store their honey;
Thence sally forth to forage through the fields,
And swarm in emigrating legions thence.
There little burrowing animals throw up
Hillocks beneath the over arching ribs
While birds within the spinal labyrinth
Contrive their nests.

THESE stupendous creatures inhabit the tropical forests of Asia and Africa, living in troops or herds, in a state of inoffensive quiet, unless when attacked by some of their larger and stronger animal assailants, or their powerful and more relentless enemy, man. They delight in the boundless forest, and in the vicinity of water,

where a more gorgeous and efficient shade is afforded, and they can enjoy the luxury of a cold bath, and wallow covered at once from the influence of the sun, and the torment of insects. Here the herd, guided by some monstrous male, long standing in years, spends the forenoon heats, at evening or morning venturing to the outskirts or open glades, to feed on the tender foliage, which they can reach, and are able to pluck from a great height by means of their trunks or probosces. They are particularly fond of those of a saccharine quality, whence they often enter and do prodigious damage in the plantations of the sugar cane. They are easily alarmed, and retreat to cover upon the alarm being given by their leader; but when attacked or wounded, they turn upon their assailant with the utmost fury, and unless he has previously prepared a way of escape, seldom fail in wreaking their vengeance, and satisfying their revenge, by mangling and trampling the body long after life has been extinct.

Two species of Elephants now existing have been described; the one inhabiting the Asiatic continent, the other the African. The principal external distinction is the immense size of the ears in the last, compared with those of the Indian animal, as we have endeavoured to represent on our plates. We shall now describe and illustrate the species separately; and first,

THE ELEPHANT OF INDIA.

Elephas Indicus.—CUVIER.

PLATE II.

Elephas maximus, *Linn.* — Elephas Indicus, l' Elephant des Indes, *Cuv. Regne Anim.*—*Griff. Synopsis.*

THE Indian Elephant is distinguished by an oblong head, concave forehead, by the crown of the cheek teeth presenting undulating transverse ridges, which are the separations of the laminæ which compose them, worn down by trituration. There are four nails on the hind feet, and the ears are small compared with its African congener. It is found in the forests of the southern parts of India, and in many of the eastern islands. It has been from time immemorial under the dominion of man, having been used in his wars, as his beast of draught and burden, and even to attack and capture its own species. Those in a domestic state are tended with the greatest care and luxury, and a favourite and tractable Elephant is almost invaluable.

A full grown Elephant has a most unwieldy

PLATE II.

ELEPHANT OF INDIA.

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appearance, yet his activity and speed are very great, a swift horse being sometimes unable to get away from him. The skin is thick and hard, dry like, and wrinkled into folds about the setting on of the legs, on the neck and breast. It is of a brownish gray colour, sometimes slightly mottled with flesh colour, and is thinly set with rigid hairs of a somewhat similar tint, which are most abundant on the head. The form of the head varies with age, it increases immensely in the adults, and exhibits the depth of sinus, which almost entirely surrounds the cavity of the head, and is observed in the skeleton. The teeth are often of immense weight, and with the tusks are the most valuable part of the animal, and for which they were formerly much persecuted. There are sometimes twenty transverse ridges in a single tooth. The tusks grow to a very large size, but are of a concentric structure, and afford the finest ivory. The first tusks are shed when they have obtained the length of three or four inches, and are replaced by the permanent ones, which sometimes reach an enormous size. They are composed of conical layers, set in one after the other, the interior being the last produced. The base is hollowed into a conical cavity, prolonged into a narrow canal, which runs along the centre of the tusk, and is filled with a blackish matter. The outward layer

is true enamel, but is not harder than the centra part of the tooth or the ivory. The external ear is large, but small compared with that of the next animal. The eyes are very small, with round pupils, and with a piggish expression. The feet have five toes, which are concealed by an envelope of skin, (and are only shewn at the tips by the nails) which fits them and protects them like a slipper. But the most remarkable portion of the structure of the Elephant, is what is usually called the trunk or proboscis, properly an elongation of the nose, and used as an organ of prehension, most valuable when we consider the unwieldy size of the head, and the shortness of the neck.* It acts also as a delicate organ of touch and of smell; it can lift an article of great minuteness, while it can raise the most immense weights; it serves also to convey drink to the mouth, which otherwise would be unattainable, and it is a weapon of defence of a most powerful description. It is formed by a membranous prolongation of the tubes of the nostrils, furnished with muscles, and covered exteriorly with tendinous expanse. The muscles which move the trunk are of two kinds,—the longitudinal ones, divided

* Among herbivorous animals we have noticed a relative proportion between the neck and the legs, but here there is none, and a substitute was required, which we find beautifully compensated by the trunk.

into a number of arcs, of which the convex part is exterior, and the two ends adhere to the internal membrane; and of transverse muscles, which stretch from the internal to the external membrane, like the rays of a circle. These last straiten the outward covering, without closing the internal canal, and by this action they lengthen the trunk, by forcing the longitudinal muscles to stretch themselves. The others by contracting shorten the trunk, either entirely when they are all brought into action, or in different parts, either on one or more sides at a time, in one or more portions of its length, and which produces various curves on several parts of its surface, either in a spiral direction, regularly or irregularly; a mechanism at once simple and useful. At the extremity there is an appendage in the form of a finger, by which very small bodies can be raised; and the whole organ displays one of the most beautiful instruments, remarkable for its simplicity, delicacy of sense and action, and for its strength.

The general height of the Indian Elephant is from eight to ten feet; that of the female, about seven or eight. Mr Scott, of Sinton, mentions one male as the largest he had heard of, twelve feet two inches high, from the crown of the head to the ground; and at the shoulder, about ten feet five inches. The length was fifteen feet. But the

collection of Petersburgh possesses a skeleton fourteen feet high, and one or two are recorded of thirteen feet and a half. The young animal grows very rapidly at first; by the second year it has reached a height of four feet; after this period, it increases more slowly, till it has reached twenty or twenty-two years. They are suckled for two years; and, in a wild state, the young run for suck indiscriminately to any female without regard to the mother, and thus the cry of distress from any of the young, generally arouses the herd. The tusks are shed about the twelfth or thirteenth year. The cheek teeth appear about six or seven weeks after birth.

Like other animals, the Elephant is subject to variation. Difference of the general colour is frequently seen, and some of a reddish hue are met with; but this has been attributed to adventitious matter received upon the skin by rubbing, though, as a variety, it is still asserted by some to exist naturally. A similar kind is found in Africa. But the white Elephant, occasioned by albynism, is the most valuable, held even in veneration, and always brings a most extravagant price. The different direction of the tusks has also given rise to different names: of those the most esteemed have the tusks nearly horizontal, and by the native princes they are frequently ornamented, and bear trinkets suspended.

India, and the East, are the countries where the Elephant is most subjected to the dominion of man; and where it becomes almost a necessary animal in the business of the inhabitants, of course, affording a profitable employment to the dealers in those animals, or, if one may be allowed the term, to the elephant jockies. Various modes have been devised to capture them; and they do not appear to display the same active intelligence which they do on many occasions in a tame state, or to be so timorous and wary as African travellers describe the animal of that country. One of the most commonly employed means of capture, is driving them into a *keddah*, or enclosure, with a wide or extensive opening, which is gradually narrowed, and made on the same principle with the Buffalo pounds, which we have noticed in a former volume. The strength, however, of the last enclosure, is very different. There is a broad ditch, too wide for an Elephant to stride over, of a considerable depth, and around, on the outside, is a paling of large timbers, well bound with strong battens, and supported by props at suitable distances, forming an immense bulwark. When a large herd of Elephants is discovered, or when two or more small herds are found so contiguous, as to be easily brought together, the people of the neighbouring country, who in general receive regular wages for their aid, are collected to surround them; and often assemble to the number of

six or eight thousand men, with fire-arms, drums, trumpets, fire-works, and, in short, any thing that can intimidate the herd. The whole body move slowly towards the funnel, in which is strewed a small quantity of those fruits and vegetables in which Elephants delight, such as plantains, sugar canes, &c. Many days are frequently required to drive a herd, and sometimes the Elephants are driven thirty or forty miles. The circle is gradually narrowed as the funnel is approached, and when fairly within, the funnel itself forms a part of the circle. They begin to taste some of their favourite foods, which being quickly consumed, some by degrees venture into the keddah itself. The example is soon followed, and but little coercion is required now to urge the whole within the paling, which is then secured with strong bars.

At one period, the manner of subjection, after the animals were thus enclosed, was by starvation, binding their legs with strong ropes, and gradually accustoming them to the individual who was afterwards to have them in charge. It has, however, been found to be much more advantageous to entice them by kindness; by this treatment, they are sooner subjected, and are not liable to be rendered useless from the cutting wounds inflicted by the ropes with which they were bound, and which, in a warm climate, ulcerated to an immense extent, and often proved fatal. When in a proper

state to be removed, tame males, or decoy females, are used, which lead him to the place where he is to be picketed. Here the mahout, or keeper, redoubles his care and caresses, and seldom fails to become a favourite, and often an object of great attachment to the animal.

The most singular method, however, which has been adopted for taking Elephants, is by the assistance of decoy females, which enter into the undertaking as if they were as much interested in it as their owners. This is chiefly practised with those males which have been driven off from the herd, and are wandering about by themselves. They are known by the title of *sauns*, and are valuable to dealers, being the second in size and strength to the leader of the herd. Two decoy Elephants, or koomkies, as they are termed, are generally employed in this business, attended by the mahout, provided with a black covering and strong ropes. When the wild animal is discovered, the decoys approach as near as possible, the mahout mounted, covered with his cloak, and crouching. When afraid of discovery, he slides down, and the females proceed alone on their treacherous errand, in which they generally succeed so well by caresses, as to distract the attention of the animal, and thus enable the men to bind his legs. Sometimes, during the caresses, he is led towards a tree, and his bonds made fast to it. The

clasps for the hind legs are made with a joint in the middle, and studded in the inside with short nails, which inflict much pain when the animal begins to struggle, and ultimately oblige him to desist. In case of the men being discovered during the operation of binding, the tame Elephants will attack and restrain the wild animal until they escape; and instances are even told of their having suffered death in defence of their keeper. If the binding is successful, the animal is left to himself during the first day, and, on discovering his position, vents his anger and disappointment in struggles and incessant roaring, refusing all sustenance or kindness. Thirst and exhaustion, however, begin to tame him, and he gradually receives water, and the same tame animals which captured him, with their keepers, by degrees win upon him by pampering his appetite, and doing him various acts of kindness. Before being liberated, large ropes are fastened round his body. When still troublesome,—and they sometimes make furious attempts to escape, —the leading Elephant proceeds as quickly as possible, while others goad him behind, and the mahouts spur them on.*

Another method of catching Elephants is mentioned by Colonel Williamson as practised in Nepaul and the frontier countries — a kind of

* Oriental Field Sports.

lassoing, or throwing a slip-knot over the head of the animal to be captured. Two Elephants are employed, selected for their size and speed, males being preferred. Each mahout is provided with a slip-knot of very strong rope, about two inches in circumference, and ten or twelve yards in length, exclusive of what is passed round the Elephant's body. At the end of the rope, which lies coiled on the Elephant's head, is a sliding noose, that works freely, and has affixed to it a strong cord, for the purpose of relaxing its hold as occasion may require. When the herd is discovered, the director of the hunt singles out the one to be pursued; and in this he is regulated by the size of his Elephants, for he might be run away with, by one larger and stronger than his own. The mahouts, who are accustomed to the business, are extremely expert, and rarely fail to throw the knot over in the most effectual manner, causing it to light fairly round the brows and behind the ears of the Elephant, which instinctively curls up its trunk, whereby the lower part of the knot slips under it, and completely encircles the neck. The Elephant is impeded, and time is thus given for the second hunter to come up on the other side and fasten his rope, which, being better tightened, impairs the power of breathing, or stops respiration so as to cause the

animal to fall and become a captive. He is afterwards led to his picket, sometimes with the utmost difficulty and danger, but is almost always at last overcome, temporary strangulation being again resorted to.

They are also taken in pitfalls, made soft at the bottom, in which they are allowed to remain, and starved into subjection. When sufficiently subdued to come out, they are relieved by the pit being gradually filled up, on which the animal, as if aware of the object, raises his feet, preventing himself from being buried, and patiently waits until he can step out. This method, however, is the most disliked, for the prodigious weight of the animal falling, often maims or disfigures him externally, or gives inward bruises which he feels when afterwards put to hard work.*

Among the ancients, Elephants became known, and were used in the wars of the Greeks and Romans; they were also often exhibited at their public shows and triumphs, and at their contests of wild animals. They were most probably procured both from India and Africa, as the distinctive character, in the form of the head and size of the ears, is plainly to be traced on some of the representations of ancient sculpture. The natives

* Williamson's Oriental Field Sports, i. p. 147.

at that period had, of course, some method of capturing them by stratagem; Aristotle, when describing the hunting of Elephants, (that is, for capture, not destruction,) mentions that tame ones were used, which attacked the wild animals, and these, when wearied or exhausted, were mounted by the keeper or master, and governed into obedience by a spear, — a method which would require no little share of courage and coolness. In Africa, where great slaughter of these animals has always been effected, the natives are said to ascend a tree, and to spring on the backs of the passing Elephants, slide down by the tail, and, during their short suspension, hamstring the animal.*

Let us now see for what purposes this valuable animal is used, after so much risk and labour are expended on its capture and subjection. In the ancient times of the empires of India, Elephants were the indispensable attendants upon a court and upon nobility, and were esteemed the principal among all the immense number of animals which formed part of the royal retinue. In the ninth century, the Emperor Jehengir is said to have possessed twelve thousand of these animals, while, among the nobles of his empire, forty thousand

* See a very curious old work, Elephantographia Curiosa, 1715.

were thought to be distributed,* a number which at the present time, far exceeds our ideas of even eastern magnificence, and when combined with the quantity of food, and number of attendants requisite, seems more like an oriental tale than a reality. They were then used for show, for the transport of baggage, and in war. They were fed and treated in the most careful and luxurious manner, with sugar and rice, and long and round pepper, occasionally mixed up with milk; and during the sugar season, each Elephant was furnished daily with three hundred canes for two months. In the travelling expeditions of these ancient kings, either for pleasure or war, from eight hundred to fifteen hundred Elephants were frequently employed in transporting the emperor's baggage, besides nearly an equal number of camels. Those for the battle were separated, caparisoned and protected according to the way they were to be employed, and the enemy they were to encounter; and from two thousand to three thousand of these animals were not unusual during the eastern wars of the eighth and ninth centuries. At the same courts were held almost daily the fights of wild beasts, in which the Elephants took a prominent part, and numbers of these noble animals fell, in giving a barbarous gratification to their royal masters.

* Hawkins, quoted from Ranking.

when brought to the ground? A number might in the course of time be collected into large enclosures, and when accustomed with the keeping of food and water in abundance together, would soon look on quietly like tame animals. They were then used for draft, for the transport of baggage, and in war. They were fed and treated in the most careful and delicate manner, with sugar and clove, and long red pepper occasionally mixed up with rice; and during the rainy season, when they were furnished daily with three hundred pounds of rice. In the travelling expeditions of their ancient kings, either for pleasure or war, from eight hundred to fifteen hundred elephants were frequently employed in transporting the emperor's baggage, besides nearly an equal number of camels. These for the battle were exercised, experienced and practised according to the way they were to be employed, and the military they were to encounter; and from the thousands in these thousand of these animals were annually during the eastern wars of the eighth and ninth centuries. At the same season were held almost daily the fights of wild beasts, in which the Elephants took a prominent part, and numbers of these noble animals fell, in giving a barbarous gratification to their royal masters.

* Bewick quoted from Buffon

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Even at a very early period, the Indian kings employed immense troops of Elephants, and several thousands were brought to the field. In the wars of Alexander, however, they scarcely exceeded four or five hundred; and during the height of the Roman Empire, from thirty to two hundred were all that could be mustered.

In the east, at the present time, the Elephant is only employed in carrying baggage, or in assisting to drag artillery; they do not enter into the general engagement, but their use to an army on its march is incalculable. They exhibit much sagacity in the exercise of their strength, and effect, in a degree proportioned to their superior powers, the labour of bullocks and horses. Their exertions are made by either pushing, or dragging, or lifting The forehead is generally defended with strong leather, and is the principal part employed in pushing; and where more than one is employed, they will act in concert, to render their efforts more effectual. Although still an attendant to a limited extent on the courts of the East, and valuable for the production of ivory, fortunately the Elephant does not now hold the same scale of utility it formerly did; for the hundreds of thousands of these animals which were then taken have tended, in India at least, to diminish their numbers, and to increase the difficulty of procuring them. In Africa, the capture, on account of their tusks, is great: and at Darfur,

they are still seen in large troops, Major Denham having counted forty-seven, and the natives reported herds even to two thousand.*

* The imports of Elephants' teeth, in 1831 and 1832, were, at an average, 4130 cwt., of which 2950 cwt. were retained for consumption. The medium weight of a tusk may be taken at about 60 lbs.; so that the yearly imports of 1831 and 1832, may be taken at seven thousand seven hundred and nine tusks; a fact which supposes the destruction of at least three thousand eight hundred and fifty-four male Elephants! But, supposing the tusks could only be obtained by killing the animal, the destruction would really be a good deal greater, and would most probably, indeed, amount to four thousand five hundred, or five thousand Elephants. Occasionally, however, tusks are accidentally broken, one lost in this way being replaced by a new one; and a good many are also obtained from Elephants that have died in the natural way. Still it is sufficiently obvious, that the supply from the sources now alluded to cannot be very large; and if to the quantity of ivory required for Great Britain, we add that required for the other countries of Europe, America, and Asia, the slaughter of Elephants must, after every reasonable deduction is made, appear immense; and it may well excite surprise, that the breed of this noble animal has not been more diminished. The western and eastern coasts of Africa, the Cape of Good Hope, Ceylon, India, and the countries to the eastward of the straits of Malacca, are the great marts whence supplies of ivory are derived. The imports from Western Africa into Great Britain, in 1831, amounted to 2575 cwt.; the Cape only furnished 198 cwt. The imports during the same year from India, Ceylon, and other eastern countries, were 2173 cwt. The Chinese market is principally supplied with ivory from Malacca, Siam, and Sumatra.

The chief consumption of ivory in England, is in the

In Europe, the Elephant is only known in confinement, from animals captured when young and imported, or from one or two adult specimens sent as presents. In this country, till very lately, they have always been kept in a situation too confined to afford any good idea of their manners, and in the restraint of a cage could only exhibit a few tricks, taught them by their keepers, to please the popular part of their visiters; but they give us no idea of the healthy animal among his own luxuriant foliage. In the more extended paddock, and supply of water which our various zoological gardens now allow to the large Pachydermes, we may expect an improvement of their keeping, and to see them in as free a condition as we can well expect, without going to look for them in India or Africa.

The most remarkable Asiatic Elephant which

manufacture of handles for knives; but it is also extensively used in the manufacture of musical and mathematical instruments, chess-men, billiard-balls, plates for miniatures, toys, &c. Ivory articles are said to be manufactured to a greater extent, and with better success, at Dieppe, than in any other place in Europe. But the preparation of this beautiful material is much better understood by the Chinese, than by any other people. No European artist has hitherto succeeded in cutting concentric balls after the manner of the Chinese: and their boxes, chess-men, and other ivory articles, are all far superior to any that are to be met with any where else.—*M'Culloch's Dictionary of Commerce*, p. 737.

has been lately exhibited in England, was that which it was necessary to destroy in Exeter Change, during one of his periodical paroxysms of fury. He was, at first, a fine animal, remarkable for docility; and had previously belonged to Mr Harris of Covent Garden theatre, who paid nine hundred guineas for the animal, and introduced him upon the stage in the procession incidental to a grand pantomime, called Harlequin Padmanaba.* We were fortunate in seeing this animal play his part, apparently with delight, and with great gentleness and docility, moving around the crowded stage, as if conscious of his ponderous bulk, and the feeble resistance that could be made to any opposition which he might offer. His death afterwards was painful, though absolutely necessary; nearly two hundred balls must have pierced him; and when we consider the naked African going out alone to the hunt, and sometimes bringing down this huge animal with a single ball, we cannot help thinking that a little previous coolness and deliberation would have saved both much pain and danger.

So many anecdotes of this animal are continually before the public, that we do not propose

* See a lengthened account of the death of this animal in Griffith's Cuvier, p. 348, vol. iii.

introducing any in illustration of its disposition or docility; for, indeed, we scarcely know where to find a new one. They have often also been twisted to serve the immediate purpose of the writer, or exaggerated to maintain some wonderful exertion of intellect. Suffice it to say, that, looking to all our accounts of both the known species as impartially as possible, we cannot attribute a greater portion of intellect to the Elephant than we could to some other animals. In a wild state, his actions are all guided by his passions—blind fury when attacked — the care and comfort of his body—or his attachment for the female; and we have seen his passion, in this latter case, so blind as actually to allow him to be taken. In captivity, he is docile, possesses an excellent memory, and from this qualification performs most of his useful labours, for without memory or experience he will not undertake any new operation, until it is explained. The same faculty makes him revenge bad treatment, and long remember it. At the periodical seasons, he becomes almost as infuriated as when wild, and will at times not even obey his keeper or his favourites; and it is necessary, at this time, even to allow the animal his liberty to range in the jungle, whence he will again return, of his own accord, to the charge and company of his keepers.

THE ELEPHANT OF AFRICA.

Elephas Africanus.—CUVIER.

PLATE IV.

Elephas Africanus, *Cuvier, Regne Anim.* E. Capensis, *Cuvier's Memoir et Hist.* Elephant d'Afrique, Loxodontes Africanus, *Fred. Cuv. Hist. Nat. des Mammiffres.*

THIS animal is distinguished from the last by its more rounded head, by its very large ears, which cover the whole shoulder, descending upon the legs, and are of such magnitude as to be employed at the Cape of Good Hope as sledges to draw tools to the field, and even to convey the sick; and by the form and structure of the cheek teeth, which have the divisions of the crown lozen-shaped, whence Fred. Cuvier has given it his new generic name of *Loxodontes.* The animal is also generally smaller in its proportions. In the colour of the skin and hair, and scanty distribution of the latter, there is little variation from the last; and the red colour of the skin, taken notice of by Vaillant, is owing to a similar cause as that we mentioned when speaking of the Asiatic Elephant.

ELEPHANT OF AFRICA.
& Young.

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The African Elephant inhabits that continent from the Cape of Good Hope to the Niger, living nearly in the same condition, and having much the same manners as its allied species in the Asiatic continent; delighting even more in the vicinity of water, and in the luxury of shade, so tempting in those parched countries. They go in herds, are equally watchful, defend their young to the utmost extremity, and are fierce and revengeful when wounded or attacked, venting their rage and revenge by trampling and mangling their victim till little vestige of him remains. They are, however, nearly, if not entirely, extirpated from the Cape colony, and one has to travel far into the interior before being gratified by a view of those stupendous animals, or indeed of any of the larger game formerly so abundant, enjoying their own forests. And we have reason to believe, from recent accounts, that the late Caffer wars have contributed farther to the extirpation of many noble animals.

Unlike the Indian animal, it scarcely has been domesticated, and is not employed for any useful labour, unless we include its employment by the ancients in war, as there seems no reason for doubting that the animals used by the Carthaginians were of African origin. Since that period, however, we have no trace of them being used in a tame state, the large race of Bullocks being employed in South Africa, and the Hor

and Camel in the northern regions; neither do any of the late travellers in Northern Africa mention them as being domesticated. It is attacked only as a sport or amusement, or as a matter of emolument. Our task will, therefore, only be to recount one or two of those dangerous adventures which so well portray the coolness and dexterity of the Hottentot, and others which may throw some light on the habits or dispositions of the animal.

The African Elephant not being of such bulky proportions as that of India, the risk of attacking it, or the difficulty of its destruction, is not thought more of than the hunting of the Lion or the Tiger in India. Colonel Williamson, a person of experience in these matters, however, is of a different opinion, and thinks, that neither "natives nor Europeans would undertake such a piece of rashness as to go out shooting wild Elephants." In Africa it is different, and all the three huge African animals are not only shot, but also speared by the naked Hottentot, who trusts to his agility only for his escape.* The encounters are certainly sometimes fatal to the aggressor, and dreadful then is the deed of retaliation and revenge. We shall transcribe one of Pringle's African sketches,

* Pringle speaks of one of the settlers at Enon lying concealed among the forest wood, and shooting the Elephants as they passed down the glen at mid-day.

during an exploratory excursion with some engineer officers, which gives a good idea of the natural haunts and habits of this species.

"I rode with them next day into the Ceded Territory; and while they ascended the Winterberg, I constructed, with the aid of the Hottentot soldiers, a sort of booth or shieling for our shelter at night, on the skirts of a wood, in a lovely verdant glen at the foot of the mountain, all alive with the amusing garrulity of monkeys and paroquets. The aspect of the Winterberg from this spot was very grand, with its coronet of rocks, its frowning front, and its steep grassy skirts, feathered over with a straggling forest partly scathed by fire. As lions were numerous in the vicinity, we took care to have a blazing watch-fire, and a couple of sentinels were placed for our protection during the night. We received, however, no disturbance, and spent a very pleasant evening in our 'greenwood bower;' the spot, in jocular commemoration of one of the party, being thenceforth denominated Fox's Kraal or Shieling.

"Next day, we followed the course of the Koonap over green sloping hills, till the increasing ruggedness of the ravines, and the prevalence of jungle, compelled us to pursue a Caffer path, now kept open only by the passage of wild animals along the river margin. The general character of the scenery I have already described.

During the forenoon, we had seen many herds of quaggas, and antelopes of various kinds, which I need not stop to enumerate; but after mid-day, we came upon the recent traces of a troop of Elephants. Their huge foot-prints were every where visible; and in the swampy spots on the banks of the river it was evident that some of them had been luxuriously enjoying themselves, by rolling their unwieldy bulks in the ooze and mud. But it was in the groves and jungles that they had left the most striking proofs of their recent presence and peculiar habits. In many places, paths had been trodden through the midst of dense thorny forests, otherwise impenetrable. They appeared to have opened up these paths with great judgment, always taking the best and shortest cut to the next open savannah, or ford of the river; and in this way their labours were of the greatest use to us by pioneering our route through a most intricate country, never ye traversed by a wheel-carriage, and great part of it, indeed, not easily accessible even on horseback. In such places, the great bull Elephant always marches in the van, bursting through the jungle, as a bullock would through a field of hops, treading down the brushwood, and breaking off with his proboscis the larger branches that obstruct the passage, whilst the females and younger part of the herd follow in his wake.

"Among the mimosa trees sprinkled over the meadows, or lower bottoms, the traces of their operations were not less apparent. Immense numbers of these trees had been torn out of the ground, and placed in an inverted position, in order to enable the animals to browse at their ease on their juicy roots, which form a favourite part of their food. I observed that, in numerous instances, when the trees were of considerable size, the Elephant had employed one of his tusks, exactly as we would use a crow-bar—thrusting it under the roots to loosen their hold of the earth, before he attempted to tear them up with his proboscis. Many of the larger mimosas had resisted all their efforts; and, indeed, it is only after heavy rains, when the soil is soft and loose, that they can successfully attempt this operation.

"While we were admiring these and other indications of the Elephant's strength and sagacity, we suddenly found ourselves, on issuing from a woody defile, in the midst of a numerous herd of those animals. None of them, however, were very close to us; but they were seen scattered in groups over the bottom and sides of a valley two or three miles in length; some browsing on the succulent spekboom, which clothed the skirts of the hills on either side; others at work among the young mimosas and evergreens sprinkled ove

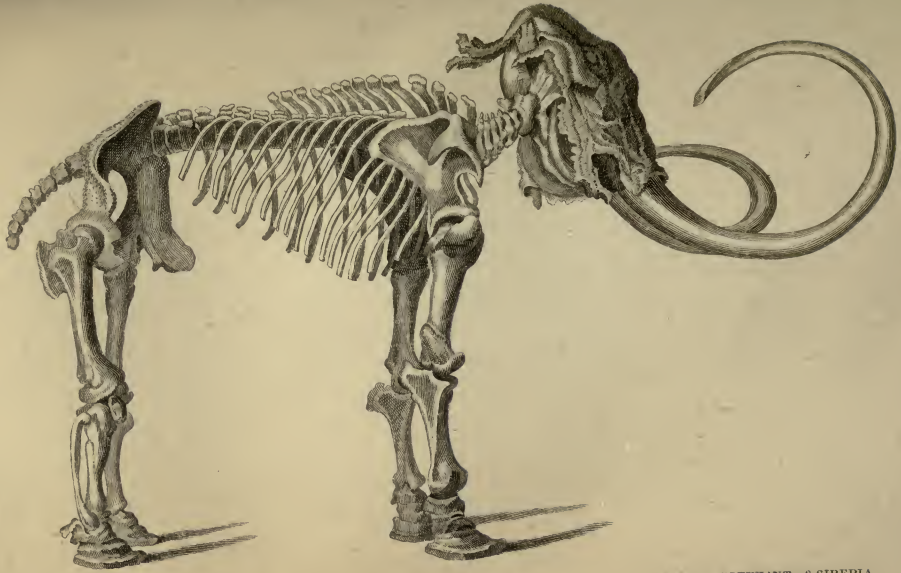
the meadows. As we proceeded cautiously onward, some of these groups came more distinctly into view—consisting apparently, in many instances, of separate families, the male, the female, and the young of different sizes; and the gigantic magnitude of the chief leaders became more and more striking. The calm and stately tranquillity of their deportment, too, was remarkable. Though we were a band of about a dozen horsemen, including our Hottentot attendants, they seemed either not to observe, or altogether to disregard, our march down the valley."

"As we rode leisurely along through a meadow thickly studded over with clumps of tall evergreens, I observed something moving over the top of a bush close a-head of us, and had just time to say to the gentleman next me—'Look out there! when we turned the corner of the bush, and beheld an enormous male Elephant standing right in the path within less than a hundred paces distance. We halted and surveyed him for a few minutes in silent admiration and astonishment. He was, indeed, a mighty and magnificent creature. The two engineer officers, who were familiar with the appearance of the Elephant in his wild state, agreed that the animal before us was at least *fourteen feet* in height; and our Hottentots, in their broken Dutch, whispered that he was '*een groot gruwzaam karl—bania*', *bania*'

groot!'— or, as one of them translated it, 'a hugeous terrible fellow, plenty, plenty big!'

"The Elephant at first did not seem to notice us, for the vision of the animal is not very acute, and the wind being pretty brisk, and we to the leeward of him, his scent and hearing, though keen, had not apprised him of our approach. But when we turned off at a gallop, making a circuit through the bushes to avoid collision with him, he was startled by the sound of our horses' feet, and turned towards us with a very menacing attitude, erecting his enormous ears, and elevating his trunk in the air, as if about to rush upon us. Had he done so, some of us would probably have been destroyed; for the Elephant can run down a well mounted horseman in a short chase; and, besides, there was another ugly defile but a little way before us, where the only passage was a difficult pass through the jungle, with a precipice on one side, and a wooded mountain on the other. However, the '*gruwzaam karl*,' fortunately, did not think proper to give chase, but remained on the same spot, looking steadfastly after us; well pleased, no doubt, to be rid of our company, and satisfied to see his family all safe around him. The latter consisted of two or three females, and as many young ones, that had hastily crowded up behind him from the river margin, as if to claim his protection, when the rushing sound of our cavalcade startled their quiet valley."

An account of the fossil *Pachydermes* would lead us beyond our limits, besides encroaching upon the contents of a volume, which we propose to devote to a consideration of ancient Mammalia, and the huge reptilian forms; but we cannot omit here a notice of the animal discovered at the mouth of the Lena, and of the Mastodon, as shewing the form of the proboscis bearing animals of the New World. The account of the first we transcribe entire, being of great interest, from the perfect and almost fresh state in which the animal was discovered, and exhibiting a different hairy covering when compared with the living animals we are now acquainted with. We add a reduced plate of the figure which accompanies it.



FOSSIL ELEPHANT of SIBERIA.

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THE ELEPHANT OF THE LENA.

PLATE V.

According to several writers, the term Mammoth is of Tartar origin, and is derived from *mama*, which signifies the earth,* and the natives of Siberia give the name of "bones of the Mammoth" to the remains of Elephants which are found in great abundance in that country, believing that the Mammoth is an animal which lives underground at the present time.

The Mammoth or Elephant's bones and tusks, are found throughout Russia, and more particularly in Eastern Siberia and the Arctic marshes. The tusks are found in great quantities, and are collected for the sake of profit, being sold to the turners in the place of the living ivory of Africa, and the warmer parts of Asia, to which it is not at all inferior.

* According to others it is derived from *behemoth*, mentioned in the book of Job, or *mehemoth*, an epithet which the Arabs commonly add to the word Elephant, to designate one which is very large. See Cuvier, Ann. du Mus. vol. viii. p. 45.

Almost the whole of the ivory-turner's work made in Russia, is from the Siberian fossil ivory, and sometimes the tusks, having hitherto always been found in abundance, are exported from thence, being less in price than the recent. Although for a long series of years, very many thousands have been annually obtained, yet they are still collected every year in great numbers on the banks of the larger rivers of the Russian empire, and more particularly those of farther Siberia. They abound most of all in the Laichovian Isles, and on the shores of the Frozen Sea. In digging wells, or foundations for buildings, there are every where discovered the entire skeletons of Elephants, which are very well preserved in the frozen soil of that country. The instances of these bones being found in the above mentioned regions, and their great numbers, are so frequently stated by Russian travellers, that it may be fairly contended that the number of Elephants now living on the globe, is greatly inferior to the number of those whose bones are remaining in Siberia.

It is particularly to be noticed, that in every climate, and under every latitude, from the range of mountains dividing Asia, to the frozen shores of the Northern Ocean, Siberia abounds with Mammoth bones. The best fossil ivory is found in the countries near to the Arctic circle, and in

he most eastern regions, which are much colder than the parts of Europe under the same latitude, and where the soil in their very short summer, is thawed only at the surface, and in some years not at all.

In the year 1805, when the Russian expedition under Krusenstern, returned for the third time to Kamschatka, Patapof, master of a Russian ship bringing victualling stores from Okhotsk, related that he had lately seen a Mammoth Elephant dug up on the shores of the Frozen Ocean, clothed with a hairy skin; and shewed, in confirmation of the fact, some hair three or four inches long of a reddish black colour, a little thicker than horse hair, which he had taken from the skin of the animal: this he gave to me, and I sent it to Professor Blumenbach. No farther knowledge has been obtained on this subject, and unfortunately Patapof was not employed by any of our societies to return to Siberia. Thus has this curious fact been consigned to oblivion; nor should we now possess any information respecting the carcass of the Mammoth, which forms more particularly the subject of this memoir, if the rumour of its discovery had not reached Mr Adams, a man of great ardour in pursuit of science, who undertook the labour of a journey to these frozen regions, and of preparing these gigantic remains, and transporting them to a great distance

The preservation of the flesh of the Mammoth through a long series of ages, is not to be wondered at, when we recollect the constant cold and frost of the climate in which it was found. It is a common practice to preserve meat and berries through the winter by freezing them, and to send fish, and all other provisions annually at that period, from the most remote of the northern provinces, to St Petersburgh and other parts of the empire.

I shall now proceed to the account which Mr Adams has published of his journey to the Icy Sea, and to the place where the carcass of the Mammoth, whose skeleton is now to be seen in our museum, was found lying on the sand and ice. It was first published in the Journal du Nord, printed at St Petersburgh, in 1807, under the title of " Relation abrégé d'un Voyage à la mer Glaciale, et decouverte des restes d'un Mammouth," and afterwards in some German ephemerides, but as they are now scarce, I shall cite his own words.

" I should reproach myself if I longer delayed the publication of a zoological discovery, which is highly interesting in its detail, since it makes us acquainted with a species of animal, whose existence was a subject of dispute among our best informed naturalists.

" I was told at Jakutsk by the merchant Popoff, chief of the body of merchants of that town, that

there had been discovered on the shores of the Frozen Ocean, near the mouth of the river Lena, an animal of extraordinary magnitude. The flesh, the skin, and the hair, were in a state of preservation, and it was supposed that the fossil production known under the name of Mammoth's horns, must have belonged to an animal of this species. Mr Popoff had, at the same time, the kindness to present me with a drawing and description of this animal, and I thought it right to send them both to the president of the academy of Petersburgh.* The news of this interesting discovery determined me to hasten the journey which I had in contemplation, for the purpose of visiting the shores of the Lena, as far as the Frozen Ocean; wishing to preserve these precious remains, which might otherwise be lost. My stay at Jakutsk, consequently, did not last many days; I set off on the 7th of June, 1806, furnished with some necessary letters, of which part were for the agents of government and the merchants, whose assistance I thought would be useful in my researches. On the 16th of June, I arrived at the little town of Schigansk, and towards the end of this same month, I was at Kuma-Surka;

* Telesius says, these are both preserved in the Academy, but describes the drawing as very bad, representing a Pig rather than an Elephant, with red hair on the back. He says that the description was quite worthy of the drawing.

from thence, I made a particular excursion, of which the Mammoth was the object, and I will now relate what my journal contains on that subject.*

" The contrary winds, which had prevailed during the whole summer, delayed my departure from Kuma: this place was then inhabited by forty or fifty Tungusian families, who were generally employed in fishing, &c.

" The wind having at length changed, I determined to pursue my journey, and passed my rein deer across the river. The next day at sun-rise, set off, accompanied by the Tungusian chief, Ossip Schumachof, the merchant of Kuma-Surka, Belkoff, my hunter, three Kossaks, and ten Tungusians. The Tungusian chief was the person who had first discovered the Mammoth, and who was proprietor of the territory through which our route lay. The merchant of Kuma-Surka had passed almost all his life on the shores of the Frozen Sea; his zeal, and the advice he gave me, have the strongest claim to my gratitude, and I even owe to him the preservation of my life in a moment of danger.

" We passed in our way over high steep mountains, valleys which followed the course of small brooks, and dry and wild plains, where not

* Some parts of this account not immediately relating to the object in view, are here omitted.

a shrub was to be seen. After two days travelling, we arrived at the shores of the Frozen Ocean. The Tungusians called it Angardam, or Terra Firma. To reach the Mammoth, we were obliged to traverse a peninsula called Byschofskoy-Mys or Tamut. This peninsula, which stretches into a spacious gulf, is on the right of the mouth of the Lena, and extends, as I was informed, from south-east to north-west, for the length of eighty wersts, (about fifty-three miles.) The name is probably derived from two points like horns, which are at the northern end of the promontory. The point on the left, which the Russians more especially call Byschofskoy-Mys, on account of its greater extent, forms three large gulfs, where are some Jakutsk settlements ; the opposite point, called Manstai, on account of the great quantity of floating wood found on its shore, is of half the size ; the bank is lower, and this canton is completely inhabited. The distance from one point to the other is reckoned at forty-five wersts, (thirty miles.) Hills form the more elevated part of the peninsula of Tamut. The rest is occupied by lakes, and all the low lands are marshy, &c.

" The peninsula of which we have just spoken, is so narrow in some places, that the sea is seen on both sides. The rein deer migrate every year regularly, abandoning these places to proceed by

the Frozen Sea, towards Borchaya and Nytjansk, and for this purpose, they assemble in large troops towards the autumn.* To follow the chase of these animals with greater success, the Tungusians have divided all the country of this peninsula into departments separated by paling. They alarm the rein deer by loud cries, and by dogs which pursue them. The rein deer frightened by this noise, run into the enclosures of the palings, where they are easily taken; all those which try escape on the ice, are shot by the hunters.

"The third day of our journey, we pitched our tents at some hundred paces distant from the Mammoth, on a hill called Kembisaga-Shaeta."

Schumachof related to me nearly in these terms the history of the discovery of the Mammoth.

"The Tungusians, who are a wandering people, remain but a little time in the same place. Those who live in the forests, often take ten years or more to travel over the vast regions between the mountains: during this time, they do not once return to their habitations. Each family lives isolated, and knows no other society. If, during the course of several years, two friends meet by chance, they then communicate to each other their adventures, their different successes in hunting, and the number of skins they have obtained. After having passed some days together, and

* Sauer Beschreibung der Billingschen Reise, p. 130.

consumed the few provisions they had, they separate cheerfully, carrying each other's compliments to their acquaintance, and trusting to Providence for another meeting. The Tungusians inhabiting the coast, differ from the former in having more regular and fixed habitations, and in collecting together at certain seasons for fishing and hunting. During winter, they inhabit cottages built side by side, so that they form villages.

"It is to one of these annual trips that we owe the discovery of the Mammoth. Towards the end of the month of August, when the fishing season in the Lena is over, Schumachof generally goes with his brothers to the peninsula of Tamut, where they employ themselves in hunting, and where the fresh fish of the sea offer them a wholesome and agreeable food. In 1799, he had constructed for his wife some cabins on the banks of the lake Oncoul, and had embarked to seek along the coasts for Mammoth horns. One day he perceived among the blocks of ice a shapeless mass, not at all resembling the large pieces of floating wood which are commonly found there. To observe it nearer, he landed, climbed up a rock, and examined this new object on all sides, but without being able to discover what it was.

"The following year, (1800,) he found the carcase of a Walrus (*Trichecus Rosmarus.*) He perceived, at the same time, that the mass he had

before seen was more disengaged from the blocks of ice, and had two projecting parts, but was still unable to make out its nature. Towards the end of the following summer, (1801,) the entire side of the animal, and one of his tusks, were quite free from the ice. On his return to the borders of the lake Oncoul, he communicated this extraordinary discovery to his wife and some of his friends; but the way in which they considered the matter filled him with grief. The old men related on the occasion their having heard their fathers say, that a similar monster had been formerly seen in the same peninsula, and that all the family of the person who discovered it had died soon afterwards. The Mammoth was, in consequence, unanimously considered as an augury of future calamity, and the Tungusian chief was so much alarmed that he fell seriously ill; but becoming convalescent, his first idea was the profit which he might obtain by selling the tusks of the animal, which were of extraordinary size and beauty. He ordered that the place where the Mammoth was found should be carefully concealed, and that strangers should, under different pretexts, be diverted from it, at the same time charging trust-worthy people to watch that the treasure was not carried off.

"But the summer of 1802, which was less warm and more windy than common, caused the Mammoth to remain buried in the ice, which had

scarcely melted at all. At length, towards the end of the fifth year, (1803,) the ardent wishes of Schumachof were happily accomplished; for the part of the ice between the earth and the Mammoth having melted more rapidly than the rest, the plane of its support became inclined, and this enormous mass fell by its own weight on a bank of sand. Of this, two Tungusians, who accompanied me, were witnesses.

"In the month of March, 1804, Schumachof came to his Mammoth, and having cut off his horns, (the tusks,) he exchanged them with the merchant Bultanoff for goods of the value of fifty rubles. At this time, a drawing was made of the animal, but very incorrect,* for it gave him pointed ears, very small eyes, horse's hoofs, and bristles all along the back, so that it represented something between a Pig and an Elephant.

"Two years afterwards, or the seventh after the discovery of the Mammoth, I fortunately traversed these distant and desert regions, and I congratulate myself in being able to prove a fact which appears so improbable. I found the Mammoth still in the same place, but altogether mutilated. The prejudices being dissipated, because the Tungusian chief had recovered his health, there was no obstacle to prevent approach to the carcass of the Mammoth; the proprietor was

* This is the drawing before mentioned page 137, note.

content with his profit from the tusks, and the Jakutski of the neighbourhood had cut off the flesh with which they fed their dogs during the scarcity. Wild beasts, such as white bears, wolves, wolverenes, and foxes, also fed upon it, and the traces of their footsteps were seen around. The skeleton, almost entirely cleared of its flesh, remained whole, with the exception of one fore leg.* The spine from the head to the os coccygis,† one scapula, the basin, and the other three extremities, were still held together by the ligaments and by parts of the skin. The head was covered with a dry skin; one of the ears, well preserved,‡ was furnished with a tuft of hairs.

"All these parts have necessarily been injured in transporting them a distance of eleven thousand wersts, (seven thousand three hundred and thirty miles.) Yet the eyes have been preserved, and the pupil of the left eye can still be distinguished.§ The point of the lower lip had been gnawed, and the upper one having been destroyed, the teeth could be perceived. The brain was still in the cranium, but appeared dried up.

* This has been restored in plaster of Paris from the other side.

† This is an error, as of twenty-eight or thirty caudal vertebræ, only eight are remaining.

‡ The ears are not well preserved, but may perhaps have suffered in so long a carriage.

§ A dried substance is visible, but it is not certain whether it is the pupil of the eye.

" The parts least injured are one fore foot and one hind foot; they are covered with skin, and have still the sole attached. According to the assertion of the Tungusian chief, the animal was so fat and well fed, that its belly hung down below the joints of the knees. This Mammoth was a male, with a long mane on the neck, but without tail or proboscis.* The skin, of which I possess three-fourths, is of a dark gray colour, covered with a reddish wool and black hairs. The dampness of the spot, where the animal had lain so long, had in some degree destroyed the hair. The entire carcass, of which I collected the bones on the spot, is four archines (nine feet four inches) high, and seven archines (sixteen feet four inches) long, from the point of the nose to the end of the tail, without including the tusks, which are a toise and a half† in length; the two together weighed three hundred and sixty pound avoirdupois; the head alone, without the tusks, weighs eleven poods and a half, four hundred and fourteen pound avoirdupois.

" The principal object of my care was to separate the bones, to arrange them, and put them up

* The places of the insertion of the muscles of the proboscis are visible on the skull. It was probably devoured as well as the end of the tail.

† Nine feet six inches measuring along the curve. The distance from the base or root of the tusk to the point, is three feet seven inches.

safely, which was done with particular attention. I had the satisfaction to find the other scapula, which had remained not far off. I next detached the skin of the side on which the animal had lain, which was well preserved. This skin was of such extraordinary weight, that ten persons found great difficulty in transporting it to the shore. After this I dug the ground in different places to ascertain whether any of its bones were buried, but principally to collect all the hairs* which the white bears had trod into the ground while devouring the flesh. Although this was difficult from the want of proper instruments, I succeeded in collecting more than a pood (thirty-six pounds) of hair. In a few days the work was completed, and I found myself in possession of a treasure which amply recompensed me for the fatigues and dangers of the journey, and the considerable expenses of the enterprise.

" The place where I found the Mammoth is about sixty paces distant from the shore, and nearly one hundred paces from the escarpment of the ice from which it had fallen. This escarpment occupies exactly the middle between the two points of the Peninsula, and is three wersts long, (two miles,) and in the place where the Mammoth was found, this rock has a perpendicular elevation of thirty or forty toises. Its sub-

* On the arrival of the skin at Petersburgh, it was totally devoid of hair.

stance is a clear pure ice; it inclines towards the sea; its top is covered with a layer of moss and friable earth, half an archine (fourteen inches) in thickness. During the heat of the month of July, a part of this crust is melted, but the rest remains frozen. Curiosity induced me to ascend two other hills at some distance from the sea; they were of the same substance and less covered with moss. In various places were seen enormous pieces of wood of all the kinds produced in Siberia; and also Mammoth's horns in great numbers appeared between the hollows of the rocks; they all were of astonishing freshness.

"How all these things could become collected there, is a question as curious as it is difficult to resolve. The inhabitants of the coast call this kind of wood *Adamschina*, and distinguish it from the floating pieces of wood which are brought down by the large rivers to the ocean, and collect in masses on the shores of the frozen sea. The latter are called *Noachina*. I have seen, when the ice melts, large lumps of earth detached upon the hills, mix with the water, and form thick muddy torrents which roll towards the sea. This earth forms wedges which fill up the spaces between the blocks of ice.

"The escarpment of ice was thirty-five to forty toises high; and, according to the report of the Tungusians, the animal was, when they first saw it, seven toises below the surface of the ice, &c.

" On arriving with the Mammoth at Borchaya, our first care was to separate the remaining flesh and ligaments from the bones, which were then packed up. When I arrived at Jakutsk, I had the good fortune to re-purchase the tusks, and from thence expedited the whole to St Petersburgh."*

The skeleton is now put up in the Museum of the Academy, and the skin still remains attached to the head and the feet.

The Mammoth is described by M. Cuvier as a different species from either of the two Elephants living at the present day, the African or the Indian. It is distinguished from them by the teeth, and by the size of the tusks, which are from ten to fifteen feet long, much curved, and have a spiral turn outwards. The alveoli of the tusks are also larger and are produced farther. The neck is shorter, the spinal processes larger, all the bones of the skeleton are stronger, and the scabruous surfaces for the insertion of the muscles more prominent than in the other species. The skin being covered with thick hair, induces M. Cuvier to consider that it was the inhabitant of a cold region. The form of the head is also different from that of the living species, as well as the arrangement of the lines of the enamel of the teeth: but for these and other particulars, see the

* Mem. of Imp. Academy of Petersburgh, vol. v.

memoirs of M. Cuvier, in the "Annales du Museum d'Histoire Naturelle."

The Mammoth more nearly resembles the Indian than the African species of Elephant.

A part of the skin, and some of the hair of this animal, were sent by Mr Adams to Sir Joseph Banks, who presented them to the Museum of the Royal College of Surgeons. The hair is entirely separated from the skin, excepting in one very small part, where it still remains firmly attached. It consists of two sorts, common hair and bristles, and of each there are several varieties, differing in length and thickness. That remaining fixed on the skin is of the colour of the camel, an inch and a half long, very thick set, and curled in locks. It is interspersed with a few bristles, about three inches long, of a dark reddish colour.

Among the separate parcels of hair are some rather redder than the short hair just mentioned, about four inches long, and some bristles nearly black, much thicker than horse hair, and from twelve to eighteen inches long.

The skin when first brought to the Museum was offensive. It is now quite dry and hard, and where most compact, is half an inch thick. Its colour is the dull black of the living Elephants.

The huge American animal, considered to belong to the tribe of Proboscideans, will exceed in size and massiveness of skeleton any of the creatures we have yet noticed. Our figure of

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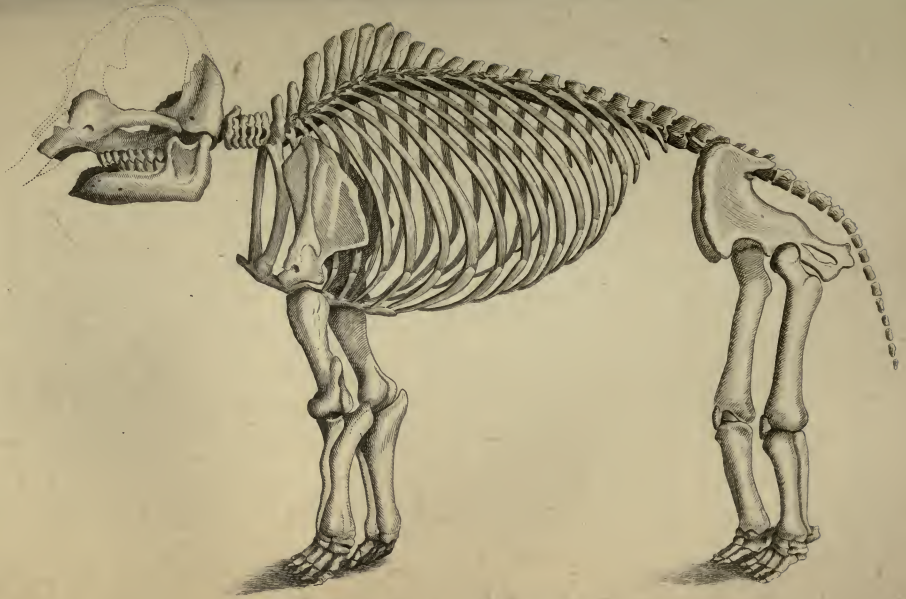
THE GREAT MASTODON,

PLATE VI.

Is taken from the Ossemens Fossiles of Cuvier, and will give some idea of the bulk and form of this creature. The remains of the Mastodon have been found over the greater part of North America, and in some places in such abundance, that to one of its localities has been applied the name of "Big bone lick;" while the frequency of their remains on the banks of the Ohio, has gained for the Mastodon the appellation of the "Animal of the Ohio."

It is considerably beyond a hundred years since these immense deposits of bones were first noticed, and they occupied a considerable portion of the attention of Pallas and Camper, and Dr Hunter, the former unravelling the confusion which had been created by considering these remains identical with the Mammoth of Siberia. But it was not until about the year 1800 that any thing approaching to a perfect skeleton was procured, which, after great labour, Mr W. Peale, founder of th-



GREAT MASTODON.

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Museum of Natural History in Philadelphia, succeeded in completing, so far as to give a tolerable idea of the form and size of this animal. In one of the deposits of bones found at Withe, in Virginia, a mass of little branches, grass, and leaves, in a half bruised state, among them a species of rose, now common in Virginia, were found enclosed in a kind of sac, which is the authority authors have, independent of their reasoning from its structure, that the animal fed on these substances; while there are records existing of the natives having found, with some heads, "a long nose, under which was the mouth."

When these remains came under the inspection of Baron Cuvier, he at once considered them as belonging to an animal, which would form a genus different from the Elephant, and proposed for it the title of *Mastodon*, from the mammillary form of the teeth; and after concluding his examination, he sums up the whole, by giving an opinion of the form and mode of life of this animal.

"That the great Mastodon, or animal of the Ohio, resembled the Elephant in its tusks and osteology, except in the form of the grinders; that it had most probably a trunk; that its height did not surpass that of the Elephant, but that it was of a larger form, and had thicker limbs, with a

less capacious belly; that notwithstanding these agreements, the peculiar structure of the grinders would be sufficient to characterize it as a genus different from the Elephant; that it fed much in the same manner as the Hippopotamus, or Wild Boar, preferring the roots and other fleshy parts of vegetables; that this kind of nourishment would lead it to seek the soft or marshy grounds; but that, nevertheless, it was not formed to swim and live in the water like the Hippopotamus, but was truly a land animal; that the bones are now very common in North America; that they are there better preserved, and fresher than the other fossil bones, but there is not the least proof or authentic information which could lead to the supposition, that the animal now exists either in America or elsewhere."

The remains of other animals apparently resembling the Mastodon, have been discovered in Europe and South America; so that even this form seems to have had its congeners in an ancient world.

The next animal to which we shall advert, now lives in the waters of Africa; it is

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THE HIPPOPOTAMUS.

The Hippopotamus, amidst the flood
Flexile and active as the smallest swimmer,
But on the bank ill balanced and infirm.

Following the Elephants of such stupendous animal bulk, we have placed in our systems an animal nearly as large, but standing much lower upon its limbs, while it is entirely aquatic in its habits. Upon the land it is certainly the most unwieldy and unshapely animal in existence, and like all the aquatic mammalia we are acquainted with, the form is round, shapeless, but smooth, and possessing no sudden angles, which, while they might assist the symmetry, would offer resistance when swimming. The skin is hairless, almost like that of the Cetaceæ when newly seen after immersion; and underneath there is a thick coat of fat, as under the skin of the Swine, and perhaps somewhat analogous to the blubber of the Whale.

One species only of Hippopotamus is yet known with any degree of authenticity; it is

THE COMMON HIPPOPOTAMUS.

Hippopotamus amphibius.—Auct.

PLATE VII.

The Hippopotamus inhabits principally the rivers of South Africa, but is receding fast before civilization, and it is not now found without a march of considerable distance to the interior. The rivers of the north of Egypt, on the Nile, are also inhabited by them, where they are gregarious in small parties. Like all the large animals of this family, they are herbivorous, and only quit the water by night, or during the greatest seclusion, feeding on roots and succulent stems of large aquatic plants. Their system of dentition is fitted for cutting and bruising; the teeth are of large size, very heavy, and yield the firmest and hardest kind of ivory. The eyes, nostrils, and ears, are all placed nearly on the same plane, which allows the use of three senses, and of respiration, with a very small portion of the animal being exposed, and a shot at the whole great bulk of the animal can scarcely ever

THE HIPPOPOTAMUS. Native of Africa.

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be obtained. By the natives they are trapped in pits, while the colonists use the rifle. They are valuable both on account of the uses to which their skins are applied, their much esteemed meat, and particularly for the estimation in which the ivory of their teeth is held.

Burchell describes the colour of the animal as of an uniform hue, correctly imitated by a light tint of China ink, and having the skin destitute of hair, except a few scattered bristles on the muzzle, edges of the ears, and tail. The eyes and ears were disproportionally small; the mouth altogether disproportionally large. The animal alluded to was the first of the kind Mr Burchell had seen newly killed. It was said only to be half grown, yet its bulk was equal to two oxen. Upon arriving at the spot, they were floating the animal to the bank, and were labouring hard to get it out of the water; the monstrous size, and almost shapeless mass of even a small Hippopotamus, when lying on the ground, compared with the people who stood around it, appeared enormous. When rolled upon the grassy bank, all who had knives immediately fell to work in cutting it up. The hide, above an inch in thickness, and hardly flexible, was dragged off, as if they had been tearing the planks from a ship's side; it was carefully divided into pieces, that would best admit of being cut into shamboks,

as these constituted to the Klaar-water people the greatest part of the profits. The ribs are covered with a thick layer of fat, celebrated as the greatest delicacy, and known to the colonists as a rarity by the name of *Zeekœ-spek*, (sea-cow pork.) This can only be preserved by salting; as on attempting to dry it in the sun, in the same manner as the other parts of the animal, it melts away. The rest of the flesh consists entirely of lean; and was, as usual with all other game, cut into large slices, and dried on the bushes, reserving only enough for the present use. Three bushels, at least, of half chewed grass were taken out of its stomach and intestines.*

It has been generally considered, that there is only one species of Hippopotamus known from recent specimens. M. Desmoulins is the only person who has given us any reason to doubt it, and as we find other animals of North and South, or South and West Africa, though closely allied, to differ, there is reason to suppose, that in this case we may also have distinct species. The question is at present quite undecided. M. Desmoulins takes his characters from the skeleton of a Hippopotamus from the Cape, and one from Senegal. In the first, the sagittal crest is, at least, a fifth of the distance from the occipital crest, to

* Burchell's Travels in South Africa.

the end of the nose; in the other, which is larger, it is scarcely the sixth. In the animal of the Cape, the lower lateral incisors are more bent. The canine teeth do not seem to be similarly used in the two animals, which would argue, that there was a different mechanism employed in the movements of the jaw; and they are always larger in the Senegal animal. Very many smaller distinctions are pointed out, which occur in comparing the different bones of the animals; but these it is impossible to describe without an actual comparison. They are, upon the whole, not considered less than those which the Baron has pointed out as separating the fossil from the living species He has applied to them the titles of *H. Capensis* and *H. Senegalinsis.*

Three fossil species have been indicated — *H. major, minor*, and *medius.*

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RHINOCEROS.

The Rhinoceri are another race of enormous animals, which are peculiar to the warm parts of Africa and India, inhabiting the districts where vegetation is profuse, and where there is an abundance of water. They may be said to be characterized externally, principally by the great thickness and strength of their skin, which is destitute of hair, often arranged in folds, and presents, as it were, a mailed armour, almost impenetrable to an ordinary leaden bullet; and by the nose and snout being furnished by one or two excrescences having the form and appearance of curved formidable horns. These are of a substance as if hair was agglutinated together, and rendered compact, possessing no central sheath, and unconnected with the bone of the skull. Mr Burchell's remarks on their structure are interesting. " The horn of the Rhinoceros, differing in structure from that of every other animal, and placed in a situation of which it is the only example, had long appeared

to me to be an anomaly very deserving examination. Dispersed over the skin of all animals are pores, which I have supposed secrete a peculiar fluid, which may be designated by the name of *corneous matter*. This secretion or fluid is designed by nature for the forming of various most useful and important additamentæ, all of which continue growing during the whole life, have an insertion not deeper than the skin, and are farther distinguished by the absence of all sensibility and vascular organization, being purely exuvial parts, like the perfected feathers of birds. In all these parts, the growth takes place by the addition of more matter at their base. When these pores are separate, they produce hairs; when they are confluent, and in a line, they produce the nails, the claws, and the hoofs, the fibrous appearance of which naturally leads to the supposition of their being confluent hairs; and the same may be said of the scales of the Manis, the quills of the Porcupine, Hedge-hog, and other animals, which may be regarded as hairs of extraordinary size. When the pores are confluent, and in a ring, they furnish the corneous core of the horns of the animals of the ruminating class; and when confluent on a circular order, they supply matter for the formation of a solid horn, such as we see in the Rhinoceros. At its base, it is, in most instances, evidently rough and fibrous, like a

worn-out brush. It grows from the skin only, in the same manner as the hair, — a circumstance which entirely divests of improbability the assertion of its sometimes being seen loose, although by no means so loose as some writers have supposed. Nor is it at all extraordinary that the Rhinoceros should possess the power of moving it to a certain degree, since the Hog, to which, in the natural arrangement, it so closely approaches, has a much greater power of moving its bristles, which, if concreted, would form a horn of the same nature."* The teeth vary considerably at different periods of their age; their feet have three toes, apparent externally, as if shod with blunt hoofs; and the real structure of their bones, with that of the other parts of the skeleton, will be seen in our first plate.

The Rhinoceri go sometimes in pairs and in small groups, but at other times are gregareous. They feed entirely on vegetables, tender branches of trees, and the grasses; and their interior structure, though simple, is very ample, the stomach and cæcum very large, the intestines very long. The upper lip is rather long, elongated into a narrow point, and prehensile, thus continuing the form of the proboscidean animals, and is used in the same way to collect and gather in the

* Burch. Trav. ii. p. 76.

vegetable food.* In temper they are slovenly and inoffensive, but on being irritated, they are furious and revengeful, possessing enormous strength, and exercising a most formidable power with their horn, which renders them no despicable assailant, even to animals the most powerful and active. Their principal horn is sometimes nearly three feet in length, and though a blunt looking instrument, when wielded by an animal of such bulk and strength, is made to force its way through almost any resistance.

The skins of the Rhinoceri are used for various purposes both in Africa and India; but in the latter country they seem more pursued as a matter of emolument by the natives,—few European sportsmen liking to engage them, both from the actual danger, and the great dislike which the Elephants have to face them. Shields are made by the Indians, which will turn a leaden bullet; and their tallow is used medicinally — for which purpose we also find it mentioned in some of the old Pharmacopeias. They are shot by the native sportsmen, Colonel Williamson tells us, with *jingals*, or heavy guns, containing an iron ball of three ounces weight, and an aim is generally taken at the eye or thorax, or some of the vulnerable parts, where the skin is thinnest, and the part is

* See our account of that animal, p. 164, extracted from the description of Dr Parsons.

generally struck with the greatest correctness. According to the last mentioned writer, the Rhinoceros (and he speaks, we believe, of the *R. Indicus*) is a much more active animal than what he is represented to be by others, possessing great acuteness of smell, great rapidity of motion, and accompanied by a vivacity, such as a cursory view of the animal would by no means suggest. He writes also of this animal making wanton attacks on the Elephant whenever he has an opportunity, and mentions the circumstance of the latter being found with the belly torn open. An instance is, at the same time, related, as well known, of a Rhinoceros, which even rendered the roads impassable by attacking travellers, or those who passed near his haunts; and he relates an attack upon a sporting company, which was made by the same animal in the close of the year 1788, as generally known to the army and residents of the district. "Two officers belonging to the troops cantoned at Dunapore, near Patna, went down the river towards Monghyr, to shoot and hunt. They had encamped in the vicinity of Derriapore, and had heard some reports of a Gheudah, or Rhinoceros, having attacked some travellers many miles off. One morning, just as they were rising about day break, to go in quest of game, they heard a violent uproar; and on looking out, found that a Rhinoceros was goring

their horses, both of which being fastened by their head and heel with ropes, were consequently unable either to escape or resist. Their servants took to their heels, and concealed themselves in the neighbouring *jow* jungles; and the gentlemen had just time to climb up into a small tree not far distant, before the furious beast, having completed the destruction of the horses, turned his attention to their masters. They were barely out of his reach, and by no means exempt from danger, especially as he assumed a threatening appearance, and seemed intent on their downfall. After keeping them in dreadful suspense for some time, and using some efforts to dislodge them, seeing the sun rise, he retreated to his haunt; not, however, without occasionally casting an eye back as with regret at leaving what he wanted the power to destroy."*

Both a single and two horned Rhinoceros was known to the ancients, as we know from their sculpture, coins, and writings. What the individual species were, we cannot now so well make out.

We shall now examine the species which have been recorded; and shall first notice the animals of the Indian continent.

* Oriental Field Sports.

THE INDIAN RHINOCEROS.

Rhinoceros Indicus. — Cuv.

PLATES VIII. and IX.

R. unicornis, *Linn.* — Indian Rhinoceros, *Dr Parsons* — *Griffith's Cuvier* — *Menagerie du Musee.*

This is the oldest known species of modern days. It has been figured by Albert Durer, Dr Parsons, and Edwards; more lately by Frederick Cuvier, in his great work, and by Griffiths, in the Animal Kingdom of Cuvier, both from the same animal, which was first exhibited in London, and afterwards reached the Parisian menagerie. Dr Parsons' account was taken from a specimen exhibited in London in 1739; the animal was young, and the horn had scarcely reached the length of more than an inch. We add a great portion of his interesting and minute description.

"He was fed here with rice, sugar, and hay: of the first he ate seven pounds mixed with three of sugar every day, divided into three meals; and

INDIAN RHINOCEROS.
Liverpool Zool. Gardens.

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Liverpool Zool. Gardens

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about a truss of hay in a week, besides greens of different kinds, which were often brought to him, and of which he seemed fonder than of his dry victuals; and drank large quantities of water at a time, being then, it seems, two years old.

" He appeared very peaceable in his temper, suffering himself to be handled in any part of his body; but outrageous when struck or hungry, and pacified in either case only by victuals. In his outrage he jumps about, and springs to an incredible height, driving his head against the walls of the place with great fury and quickness, notwithstanding his lumpish aspect: this Dr Parsons saw several times, especially in a morning, before his rice and sugar were given him.

" In height he did not exceed a young heifer, but was very broad and thick. His head, in proportion, is very large, having the hinder part, next his ears, extremely high, in proportion to the rest of his face, which is flat, and sinks down suddenly forward towards the middle, rising again to the horn, but in a less degree. The horn stands on the nose of the animal, as on a hill. The part of the bone on which the horn is fixed, rises into a blunt cone, to answer to a cavity in the basis of the horn, which is very hard and solid, having no manner of hollow nor core, like those of other quadrupeds. That of this animal, being young, does not rise from its

rough base above an inch high, is black and smooth at the top, like those of the ox-kind, but rugged downwards; the determination of its growth is backwards, instead of straight up; which is apparent, as well in the different horns of old Rhinoceroses, as in this of our present subject; for the distance from the base to the apex of this, backward, is not within a third part so long as that before, and it has a curved direction; and, considering the proportion of this animal's size to its horn, we may justly imagine, that the creature which bore any one of those great ones, must have been a stupendous animal in size and strength; and, indeed, it were no wonder, if such were untractable at any rate.

"The sides of his under jaw are wide asunder, slanting outward to the lower edge; and backward to the neck, the edges turn outward; from this structure his head naturally looks large. The part that reaches from the fore part of the horn towards the upper lip, may be called the nose, being very bulky, and having a kind of circular sweep downward towards the nostrils: on all this part he has a great number of rugæ running across the front of it, and advancing on each side towards his eyes. The nostrils are situated very low, in the same direction with the rictus oris, and not above an inch from it. If we look at him in a fore view, the whole nose, from

the top of the horn to the bottom of his lower lip, seems shaped like a bell, namely, small and narrow at top, with a broad base. His under lip is like that of an ox, but the upper more like that of a horse; using it, as that creature does, to gather the hay from the rack, or grass from the ground; with this difference, that the Rhinoceros has a power of stretching it out above six inches, to a point, and doubling it round a stick or one's finger, holding it fast; so that, as to that action, it is not unlike the proboscis of an Elephant.

"As to the tongue of the Rhinoceros, though it be confidently reported by authors, that it is so rough as to be capable of rubbing a man's flesh from his bones; yet that of our present animal is soft, and as smooth as that of a calf; which Dr Parsons often felt, having had his hand sucked several times by him. Whether it may grow more rough as the beast grows older, we cannot say. His eyes are dull and sleepy, much like a hog in shape, and situated nearer the nose than that of any quadruped ever seen, which he very seldom opens entirely. His ears are broad and thin towards the tops, much like those of a hog; but have each a narrow round root with some rugæ about it; and rises, as it were, out of a sinus surrounded with a plica. His neck is very short, being that part which lies between the back edge of the jaw and the plica of the shoulder; on

this part there are two distinct folds, which go quite round it, only the fore one is broken underneath, and has a hollow flap hanging from it, so deep that it would contain a man's fist shut, the concave side being forward. From the middle of the hinder one of these folds or plicæ, arises another, which, passing backwards along the neck, is lost before it reaches that which surrounds the fore part of the body. His shoulders are very thick and heavy, and have each another fold downward, that crosses the fore leg; and almost meeting that of the fore part of the body just mentioned, they both double under the belly close behind the fore leg.

"His body, in general, is very thick, and juts out at the sides like that of a cow with calf. He has a hollow in his back, which is mostly forward, but backwards, the line or ridge rises much higher than that of the withers; and, forming the plica on the loins, falls down suddenly to the tail, making an uneven line. His belly hangs low, being not far from the ground, as it sinks much in the middle. From the highest point in his back, the plica of the loins runs down on each side between the last ribs and the hip, and is lost before it comes to the belly; but, above the place of its being lost, another arises, and runs backward round the hind legs, a little above the joint; this he calls the crural fold, which turns up

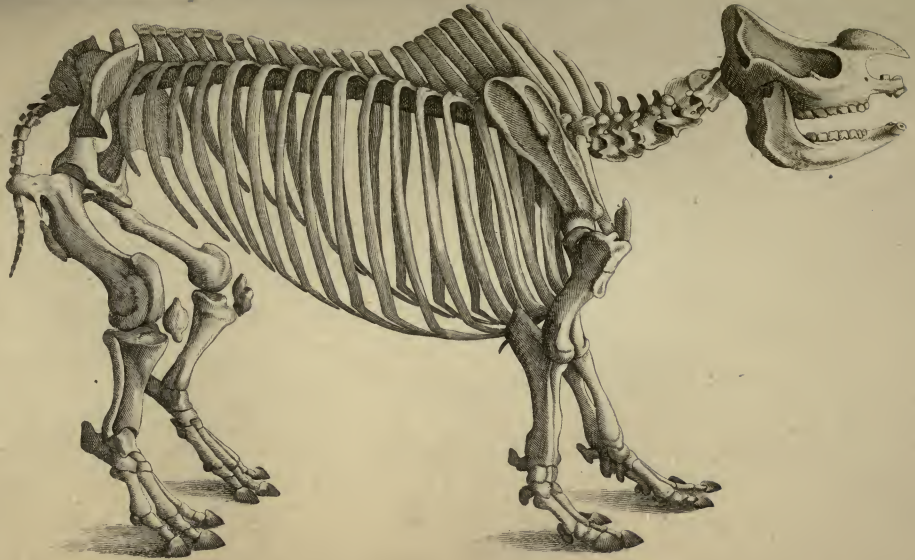
behind till it meets another transverse one, which runs from the side of the tail forward, and is lost before it reaches within two inches of that of the loins. The legs are thick and strong; those before, when he stands firm, bend back at the knee, a great way from a straight line, being very round, and somewhat taper downwards. The hinder legs are also very strong, bending backwards at the joint to a blunt angle, under which the limbs grow smaller, and then becomes gradually thicker, as it approaches the foot; so also does that part of the fore leg. About the joint of each of his legs, there is a remarkable plica when he bends them in lying down, which disappears when he stands."

Another specimen, as we have mentioned, was exhibited in London in 1815, and a good figure appeared in Griffith. This animal, to judge from the figure, was of a much greater age than Dr Parsons',—the horn lengthened, and appearing a formidable weapon.

The animal recorded by F. Cuvier as being in the Parisian menagerie, is nearly thus noticed. The height, at the most elevated part of the back, was four feet ten inches, and its entire length about nine feet. The body was covered with a thick tuberculated and almost naked skin, formed into irregular folds. The natural colour of the skin, was a dull grayish violet, but it appeared

Another method for Ornamental purposes.—Procure a piece of Chamois Leather, and cut it into a shape as in the figure

[illegible] and [illegible] are to be [illegible] the [illegible] of the [illegible] and [illegible] [illegible] [illegible]



RHINOCEROS.

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Islands, and was first discovered in Sumatra by Dr Horsfield and Sir Stamford Raffles, while the distinctions were pointed out and the name applied by Baron Cuvier.

	Feet	Inches
Length of hind feet, from the fold of the skin, to the toes,	1	8
Girth of ditto,	2	$6\frac{3}{4}$
Width from the Tygoma *over* the skull,	1	5
Width from the same point *under* the skull,	3	0
Length from the fold of the skin, at the back of the head, to the tip of the lower jaw,	2	$0\frac{7}{8}$
Width of the fold of the skin straight across the shoulder,	1	11
Width of the fold of skin straight along the body,	2	10
Girth of the middle of the belly,	9	$4\frac{1}{4}$
Girth of the neck *within* the folds,	4	$4\frac{1}{2}$
Space between the base of the ears,	0	4
Length of the ears,	1	$0\frac{3}{8}$
Space from the ear to the eye,	1	0
Space from the eye to the nostril,	0	9
Length of the eye,	0	2

I have said nothing of the general appearance of the animal, because the common engravings give a very correct idea of its figure. Its eye is dull, and its disposition is heavy and sluggish, seeming inclined to sleep a good deal. The keeper appears to have it in great subjection; but on one occasion, during his absence, it shewed a sudden ebullition of irritation, when it repeatedly knocked its head with considerable violence against the wall with great quickness; but on the reappearance of the keeper, immediately became tranquil. The only noise I have ever heard it emit, was like the lowing of a calf. Much has been written about the roughness of the tongue; the tongue of this individual appears to me to be very similar to that of a cow, except that it is much thinner at the point.

ONE HORNED SUMATRAN RHINOCEROS.

Rhinoceros Sondaicus.—Cuvier.

PLATE X.

Rhinoceros Sondaicus, *Cuv.* — Horsfield's *Zool. Researches in Java.*

The chief distinctions are seen in the more attenuated head and muzzle. The folds appear less rough and prominent; those of the neck comparatively smaller; and the posterior fold, which has an oblique direction towards the spine, is less extended. The thick covering, or coat, is divided on the surface into small tubercles, or polygonous scutula; and a few short bristly hairs, rising from a slight depression in the centre, constitute a peculiar character. The ears are bordered with a series of long stiff bristles, closely arranged, and a similar series also extends along the tail through its whole length. Dr Horsfield gives the following description of its habits.

"The individual represented in our plate, and which has afforded the preceding details, was

SUMATRAN RHINOCEROS.

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taken, when very young, in the forests of the province of Keddu, and was conveyed to the residency at Magellan, in the year 1815 or 1816.

"By kind treatment, it soon became domesticated to such a degree, that it permitted itself to be carried in a large vehicle, resembling a cart, to the capital of Surracarta. I saw it during its conveyance, and found it perfectly mild and tractable. At Surracarta, it was confined in the large area or square which bounds the entrance to the royal residence.

"A deep ditch, about three feet wide, limited its range, and for several years it never attempted to pass it. It was perfectly reconciled to its confinement, and never exhibited any symptoms of uneasiness or rage, although, on its first arrival, harassed in various ways by a large proportion of the inhabitants of a populous capital, whose curiosity induced them to inspect the stranger of the forest. Branches of trees, shrubs, and various other twining plants, were abundantly provided for its food. Of these the spices of *cissus* and the small twigs of a native fig tree, were preferred: but plantains were the most favourite food, and the abundant manner in which it was supplied with these by the numerous visiters, tended greatly to make the animal mild and sociable. It allowed itself to be handled and examined freely, and the more daring of the visiters some-

times mounted on its back. It required copious supplies of water; and, when not taking food, or intentionally roused by the natives, it generally placed itself in the large excavations, which its movements soon caused in the soft earth that covered the allotted space.

" The animal rapidly increased in size. In the year 1817, having been confined at Surracarta about nine or ten months, the dimensions, as already stated, were nine feet in length, and four feet three inches in height at the rump. In 1821 it had acquired the height of five feet seven inches. This information I received from my friend Mr Stavers, who is now in England, on a visit from the interior of Java; and he favoured me farther with the following details, which complete the history of the individual whose figure is annexed. Having considerably increased in size, the ditch of three feet in breadth was insufficient for confining it; but, leaving the enclosure, it frequently passed to the dwellings of the natives, destroying the plantations of fruit trees, and culinary vegetables, which always surround them. It likewise terrified those natives that accidentally met with it, and who were unacquainted with its appearance and habits. But it shewed no ill-natured disposition, and readily allowed itself to be driven back to the enclosure like a Buffalo. The excessive excavations which it made by continually wallow-

ing in the mire, and the accumulation of putrifying vegetable matter, in process of time became offensive at the entrance of the palace, and its removal was ordered by the Emperor to a small village near the confines of the capital, where, in the year 1821, it was accidentally drowned in a rivulet.

"The Rhinoceros lives gregarious in many parts of Java. It is not limited to a particular region or climate, but its range extends from the level of the ocean to the summit of mountains of considerable elevation. I noticed it at Tangung, near the confines of the Southern Ocean, in the districts of the native princes, and on the summit of the high peaks of the Priangang regions, but it prefers high situations. It is not generally distributed, but is tolerably numerous in circumscribed spots, distant from the dwellings of man, and covered with a profuse vegetation. On the whole, it is more abundant in the western than in the eastern districts of the island. Its retreats are discovered by deeply excavated passages which it forms along the declivities of mountains and hills. I found them occasionally of great depth and extent.

"In its manners the Rhinoceros of Java is comparatively mild. It is not unfrequently met in the wilds by Europeans and by natives. No instance of its shewing a disposition to make an attack has come to my knowledge. Being the

largest animal in Java, its passions are not roused, as in many parts of India, by contentions with the Elephant. It is rarely seen in a domestic state, but it is occasionally decoyed into pits, and destroyed. Our animal rambles chiefly at night, and often occasions serious injury to the plantations of coffee and pepper, which are laid out in the fertile districts selected for its retreat.

"The horns and skin are employed for medicinal purposes by the natives."*

* Horsfield's Zool. Researches in Java.

TWO HORNED SUMATRAN RHINOCEROS.
F. Cuvier

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THE TWO-HORNED SUMATRAN RHINOCEROS.

Rhinoceros Sumatranus.

PLATE XI.

Sumatran Rhinoceros, *Bell, Phil. Trans.* — Rhinoceros de Sumatra, *F. Cuv. Mammiff.*—R. Bicornis Sumatranus, *Griff. Cuv.* Synopsis.—*Desmarest, Mammalogie*, ii. 401.

One of the oldest authenticated descriptions of this animal is always referred to, as given by Mr William Bell, surgeon at Bencoolen, in the Transactions of the Philosophical Society. That gentleman made his observations from an animal, shot about ten miles from Fort Marlborough, within a day from its death,—a male, four feet four inches high at the shoulder, and about eight feet five inches high. He judges, from its appearance, that it had not reached maturity. The shape of the animal was much like that of a hog. The general colour, a brownish ash; under the belly, between the legs, and fold of the skin, a dirty flesh colour. The ears were small and pointed,

lined and edged with short black hair. The horns were black, the larger was placed immediately above the nose, pointing upwards, and was bent a little back; it was about nine inches long. The small horn was four inches long, of a pyramidal shape, flattened a little, and placed above the eyes, rather a little more forward, standing in a line with the upper horn immediately above it. The neck was thick and short; the skin, on the under side, thrown into folds, and these again wrinkled. The body was bulky and round; and from the shoulder ran a line or fold, though but faintly marked: there were several other folds and wrinkles on the body and legs, and the whole gave rather the appearance of softness. The whole skin of the animal is rough, and covered very thinly with short black hair. The skin was not more than one-third of an inch in thickness at the strongest part, and under the belly scarcely one-fourth.*

In 1825, F. Cuvier gave another figure of this Rhinoceros in his *Mammifères*, which nearly agrees with what we have detailed above, the colour is a dull brown, the skin is nearly quite smooth, and without any of the tuberculated structure, which is so peculiarly seen in *R. Sondaicus*, and it is furnished with a greater

* W. Bell's Philosophical Transactions, for 1793.

proportion of short and strong hairs. The folds in the skin, with the exception of those on the neck, are shallow, and there is only one large one behind the fore legs, and another before the hind quarter. The height of this animal is only given at about three feet ten inches.

We have used the figure of F. Cuvier, and regret that there seems to be little known of the habits of this animal, farther than inhabiting the island of Sumatra.

These three species seem to be ascertained as clearly distinct in the Asiatic continent. De Blainville gave to another, which he characterized from the skull, the title of *R. Camperii;* but the species remains in uncertainty, and can scarcely be now admitted, without farther examination. From the examination of the skull, G. Cuvier thought that it might be a young species of *R. Sondaicus.*

The species of Africa, which are authenticated with any certainty, are only two, *R. Africanus* and *R. simus,* Burchell.

THE TWO-HORNED AFRICAN RHINOCEROS.

R. Africanus.—CUVIER.

PLATE XII.

R. bicornis, *Sparman, Linnæus.* — R. Africanus, *Cuvier, Burchell.*

THIS Rhinoceros, which was formerly frequent within the boundary of the Cape Colony, is the animal seen and described by most of the travellers in Africa, during the last century; and being then the only two horned species which was known, received the distinguishing epithet of *bicornis*, not, however, now a good appellation, from several species having a similar number of like appendages. It was met with frequently, and is noticed most lately, in the interesting travels of Mr Burchell, who was fortunate in being able to shoot no fewer than nine of these huge animals. Speaking of the second which came under his observation, he says, " The first view of this beast, suggested the idea of an enormous hog,

TWO HORNED AFRICAN RHINOCEROS
Daniel

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to which, besides, in its general form, it bears some outward resemblance in the shape of its skull, and the smallness of its eyes, and the proportionate size of its ears; but in its shapeless clumsy legs and feet, it more resembles the Hippopotamus and Elephant. Its length, over the forehead, and along the back, from the extremity of the nose to the insertion of the tail, was eleven feet two inches, of English measure; but in a direct line, not more than nine feet three inches. The tail, which, at its extremity, was compressed or flattened vertically, measured twenty inches, and the circumference of the largest part of the body, eight feet four inches." There was no hair, except on the edges of the ears, and on the extremity of the tail. The skin, though thick and strong, did not flatten the balls which did not strike some bone." They were, however, of a mixture of lead and tin; and Mr Burchell admits, that bullets of pure lead, fired with a small charge, or at too great a distance, would fall from the strong part of the folds, flattened and harmless.

The Rhinoceros of Africa does not seem to be looked upon with the same terror by the natives or Hottentots, as the animal of India. He possesses the same keen and nice smell, and delicate sense of hearing, and can only be approached

against wind, and they do sometimes become furious, and attack their pursuers; but the cool disposition of the native hunters, and their great agility, protects them. They allow the animal to rush impetuously on, and, when near, by shifting nimbly aside, avoid the charge, and have time, in their turn, to attack him, and to reload their muskets. They are often killed with a single ball, and one individual thinks it no hazard to act alone against them. In South Africa they are much esteemed as food, which Burchell agrees in considering excellent, much resembling beef. The tongue is considered the most delicate part. When an animal of this description is killed, the neighbours all flock around it, and encamp by its side, until they have consumed it entirely, being scarcely so provident as to dry any part of the flesh for after use. The bushmen are insatiable. They broil, eat, and talk, and no sooner have they finished one slice than they turn to the carcass, and cut another. According to Bruce, the Rhinoceros is also used as food in North Africa, and much esteemed by the Shangalla. The sole of the feet is here reckoned the part most fitting for the epicure. Of the skin, shields are sometimes made as in India, which are said to be capable of turning a musket ball; but the most useful and common application

of it is for whips, *shamboks*;* and the skin is always immediately cut up into strips for this purpose.

* The shambok is a strip three feet or more in length, of the hide either of a Hippopotamus or Rhinoceros, rounded to the thickness of a man's finger, and tapering to the top. This is universally used in the Colony for a horsewhip, and is much more durable than the whips of European manufacture. This manufacture is also known in North Africa, and forms an article of trade, under the name of *corbage*.

THE FLAT-NOSED RHINOCEROS.

Rhinoceros Simus — BURCHELL.

PLATE XIII.

Burchell, *Journal de Phys.*—*African Travels*, ii. p. 75.

THE second African species is so named from its flattened nose and mouth, by which distinctions it is easily known from the last, as well as by the different proportions of its head, and its greater size.

The following is Mr Burchell's account of this Rhinoceros: —

"In my travels in the interior of Southern Africa, I met with this animal for the first time near the 26° of latitude, inhabiting the immense plains, where they are wild during the greatest part of the year. They frequent the fountain every day, not only for drink, but also for the purpose of rolling in the mud, which, by adhering to a skin entirely free from hairs, serves to protect them from the scorching heat of the climate. The size is

FLAT-NOSED RHINOCEROS. Native of Africa

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nearly double that of the specimen named *Rhinoceros bicornis*. These two animals are recognized by the negroes and Hottentots, as two very distinct species, and are distinguished by them by different names. As we have killed ten examples, I have had sufficient opportunities of observing the characters which distinguish them. They consist principally in the form of the mouth, as may be verified by comparing the *Rhinoceros bicornis* and the *Rhinoceros unicornis* with the figure, (Pl. XIII.) which I have carefully drawn after nature. I have named this species *Rhinoceros simus*. The negroes and Hottentots inform me, that it eats nothing but grass, while the other species feeds on branches of trees and shrubs, — a peculiarity which may be inferred from the structure of the mouth. The head, when separated from the first vertebræ, was of such enormous weight, that four men could only raise it from the ground, and eight were required to put it into the carriage. The flesh of the two species is equally good to eat; and they resemble each other in having a double horn, and wanting conspicuous hairs on the skin, which distinguishes, at first sight, the *Rhinoceros unicornis*. The following comparative measures, taken from adult individuals, killed by ourselves, in these countries, will afford a proof of the difference of size: —

From the lips to the insertion of the tail of the			
Rhinoceros bicornis,	111 inches,	of *Rhinoceros simus*,	134
Length of the tail,	20 —	———	25
Circumference of the body, . .	100 —	———	140
From the extremity of the lips to the ear,	27½ —	———	43

Several extinct species of Rhinoceros are known, in part, from their remains, distinct from any of those we have been noticing. In almost every country where the bones of the Elephant have been found, they are accompanied, in nearly equal quantities, by those of the Rhinoceros. The vale of Arno, in Italy, is one of the greatest deposits, also different parts of Germany and Siberia. One of the more remarkable species, and unfortunately least known, is scarcely larger than the common hog. Our authority for its introduction rests upon the discovery of some teeth and other bones found in the department of Loire and Garonne, among the debris of other Rhinoceri, Crocodiles, and Tortoises. *R. minutus* has been applied to it.

We have now come to another genus of animals, which most of our later zoologists have agreed to bring into the present situation. It is the genus *Hyrax* of Herman, which we shall illustrate first by

SYRIAN HYRAX.
Cuvier.

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THE SYRIAN HYRAX.

Hyrax Syrianus.—GMELIN.

PLATE XIV.

Hyrax Syrianus, *Gmel.*—Ashkoko, *Bruce?*—Le Daman d'Ethiopie, H. Syriacus, *Fred. Cuvier, Hist. Nat. des Mammif.*

RECEDING, in its pigmy size, from the great bulk of the proboscidean animals, this little creature approaches nearest to the form of the Glires or Rodentia, looking like a diminutive Hare; and, instead of the strong hide, bare and wrinkled, or with only a few hard bristles, it is clothed with a thick and short fur; and, in place of dwelling in the forest, like the Elephant and Rhinoceros, or in the extensive morasses, as the Mastodon was supposed to do, it finds its retreat among the rocks, and affords a support to the birds of prey which haunt its localities, from the convenience of a ready food; and one species, from these habits, has received the title of "Rock Rabbit," or "Cape Badger."

From the close resemblance which these little animals have to many of the Glires, they have been generally placed with them. The Baron Cuvier, however, by attention to their anatomy, clearly demonstrated their alliance, at least, with the animals we have been describing, and has placed them there, while the latest published system, by Mr Swainson,* has assigned their station as the Glireform type of the Pachydermes.

Pallas, who was the first that anatomically examined the Hyrax, saw specimens alive at Amsterdam, but took his anatomical details only from the body, (as Cuvier observes, without the most important parts, the head and feet,) having been transmitted to him in spirits after skinning. By this excellent naturalist, it is placed among the *Cavies*, but with the remark, that in several points it essentially differed from them. His remarks were taken from the *H. Capensis*.

Cuvier points out the following near resemblance of the skeleton of Hyrax to some of the Pachydermes. In the general composition of the trunk, there are several alliances; and one of the more remarkable analogies is, that the Hyrax has twenty-one ribs on each side, a number greater than that of other quadrupeds, the Sloth excepted, which has twenty-three; and those animals, which

* Classification of Quadrupeds, p. 198.

have the greatest number after the Hyrax, belong precisely to this order of Pachydermes with which we wish to range them. The Elephant and Tapir have each twenty, the Rhinoceros nineteen, and the Solipedes, which approach nearest the Pachydermes, eighteen; while the most of the Rodentia, on the contrary, have but twelve or thirteen, the Beaver alone having fifteen.*

In the structure of the head it resembles the Pachydermes. The maxillary bones are very distinct from those of the Rodentia by the small size of the suborbital hole, which in the latter is enormously large. There are four lower incisive teeth, while the two above are not bent and truncated, but are triangular and pointed, and resemble those of the Hippopotamus. The other teeth also differ from those of the Rodentia; the condyle of the jaw is also different, permitting the motion from right to left. This will be illustrated on the accompanying plate of *Skull and dentition of Cape Hyrax.* Plate XV.

The number of toes in the Hyrax is four before and three behind, as in the Tapir. They are united by the skin to the very nail, as in the Elephant and Rhinoceros, and represent those of the former animal, both in their figure and in the manner in which they are placed upon the foot,

* Ossemens Fossilles.

while the wrist joint very closely resembles that of the Tapirs.

Our plate, which accompanies this, will give an idea of the form of this curious and yet limited genus. It is taken from the figure of F. Cuvier, drawn from a living specimen, which appears to have been obtained from the Exeter Change collection. All the upper parts of the body are of a brownish gray, the lower parts white; between the two colours the tint is yellowish, and the head, as well as the feet, are of a grayer tint than that of the body. The separate hairs are ringed with yellowish, black, and white. The exposed parts of the skin are blackish violet.

The specimen alluded to had all the appearance and somewhat of the habits of the Rodentia, resembling the Sphermophili. It was about eleven inches in length, and stood about ten inches high. Its movements were quick and lively. It was very active, searching around, guided by its scent, and trying to get into narrow openings, or holes, where it could lie concealed. It delights in heat, and exposes alternately the different parts of its body to the sun; while, in cold weather, it rolls itself up in its hay or litter. It was quite tame, but does not like to be seized, though it never attempts to bite, and only utters a slight hissing sound when irritated. It is an animal entirely diurnal in its habits, and completely herbivorous — fed, when

confined, on bread, roots, fruits, and herbs. It appears to have little intelligence, and little fear. When at liberty, it has the same inquisitive and searching habits, and comes freely to the hand which is held out to it.

The *Askoko* of Bruce is given as a synonym for this animal. On this account we think it worth while to transcribe his description of its habits, &c. which agree nearly with what is above mentioned.

" This curious animal is found in Ethiopia, in the caverns of the rocks, or under the great stones in the Mountain of the Sun, behind the Queen's palace at Koscam. It is also frequent in the deep caverns in the rocks in many other places in Abyssinia. It does not burrow, or make holes, as the rat and rabbit; nature having interdicted him this practice, by furnishing him with feet, the toes of which are perfectly round, and of a soft, pulpy, tender substance; the fleshy parts of the toes project beyond the nails, which are rather broad than sharp, much similar to a man's nails ill grown; and these appear to be given him rather for the defence of his soft toes, than for any active use in digging, to which they are by no means adapted.

" The whole of the fore-foot is very thick, fleshy, and soft, and of a deep black colour, altogether void of hair; though the back, or upper part of it, is thick covered like the rest of its

body, down to where the toes divide, and the hair ends; so that these long round toes very much resemble the fingers of a man.

"In place of holes, it seems to delight in less close, or more airy places, in the mouths of caves, or clefts in the rock, or where one projecting, and being open before, affords a long retreat under it, without fear that this can ever be removed by the strength or operations of man. The Askoko is gregarious, and frequently several dozens of them sit upon the great stones at the mouth of caves, and warm themselves in the sun, or even come out, and enjoy the freshness of the summer evening. They do not stand upright upon their feet, but seem to steal along as in fear, their belly being nearly close to the ground, advancing a few steps at a time, and then pausing. They have something very mild, feeble like, and timid in their deportment; are gentle, and easily tamed, though, when roughly handled at first, they bite very severely.

"This animal is found plentifully on Mount Libanus. I have seen him also among the rocks at the Pharan Promontorium, or Cape Mahomet, which divides the Elanitic from the Heroopolitic Gulf, or Gulf of Suez. In all places they seem to be the same: if there is any difference, it is in favour of the size and fatness, which those in the Mountain of the Sun seem to enjoy above the

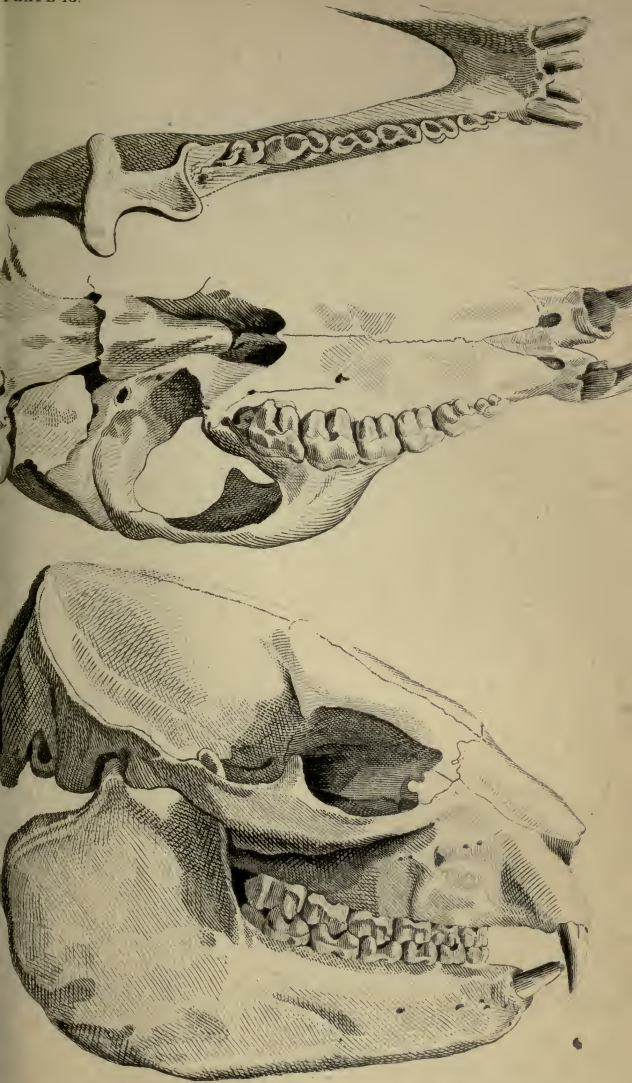
others. What is his food I cannot determine with any degree of certainty. When in my possession, he ate bread and milk, and seemed rather to be a moderate than voracious feeder. I suppose he lives upon grain, fruit, and roots. He seemed too timid and backward in his own nature to feed upon living food, or catch it by hunting.

"He makes no noise that ever I heard, but certainly chews the cud. To discover this was the principal reason of my keeping him alive. Those with whom he is acquainted he follows with great assiduity. The arrival of any living creature, even of a bird, makes him seek for a hiding place; and I shut him up in a cage with a small chicken, after omitting feeding him a whole day: the next morning the chicken was unhurt, though the Askoko came to me with great signs of having suffered from hunger. I likewise made a second experiment, by enclosing two smaller birds with him for the space of several weeks. Neither were these hurt, though both of them fed, without impediment, of the meat that was thrown into his cage; and the smallest of these, a kind of tit-mouse, seemed to be advancing in a sort of familiarity with him, though I never saw it venture to perch upon him, yet it would eat frequently, and at the same time, of the food upon which the Askoko was feeding; and in this consisted chiefly the familiarity I speak of, for the Askoko himself

never shewed any alteration of behaviour upon the presence of the bird, but treated it with a kind of absolute indifference. The cage, indeed, was large, and the birds having a perch to sit upon in the upper part of it, they did not annoy one another.

"In Amhara this animal is called Ashkoko, which, I apprehend, is derived from the singularity of those long herinaceous hairs, which, like small thorns, grow about his back, and which in Amhara are called Ashok. In Arabia and Syria he is called Israel's Sheep, or Gannim Israel; for what reason I know not, unless it be chiefly from his frequenting the rocks of Horeb and Sinai, where the children of Israel made their forty years peregrination: perhaps this name obtains only among the Arabians. I apprehend he is known by that of Saphan in the Hebrew, and is the animal erroneously called by our translators Cuniculus, the rabbit or coney."

To render the illustration of this very curious genus as complete as our limits will permit, we have introduced a figure of the species described by Pallas.



CAPE HYRAX
Cuvier.

Ivars sc.

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Stewart del.

Lizars sc.

CAPE HYRAX
Pallas.

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THE CAPE HYRAX.

Hyrax Capensis. — GMELIN.

PLATE XVI.

Covia capensis, *Pallas, Miscellaneæ Zool.* — Hyrax Capensis, *Gmel.*

THE Cape Hyrax is about the size of a Hare, but with shorter legs and more clumsy form; it is of a uniform grayish brown, and along the back is marked with a darker band. The toes on the fore feet are only three in number, whereas in the last animal they were four, a difference which is now taken as one of the principal distinctions of the animals which inhabit the opposite portion of the great African continent. This animal was of frequent occurrence in the Cape of Good Hope, living in the clefts of rocks; and in its motions, when retiring to its burrows, exhibiting many similarities to those of the common Rabbit.

Major Smith gives the following description of a third species of Hyrax, under the title of *H. arboreus*, found in many of the forests of South Africa, and inhabiting the hollows of decayed trees.

"This species rather exceeds the size of the *Hyrax capensis*, usually measuring about twenty-one inches from the tip of the nose to the extremity of the back, and about seven inches in height. In its general form, it resembles the species just named; and in the manner of moving and sitting they exactly coincide. The colour above is a sort of tawny red, freely mottled and variegated with black; on the lower parts of the sides, it is reddish white, with a less abundant intermixture of black; and beneath, as well as on the insides of the legs, it is an uniform dull white. The reddish colour arises from the tips of most of the hairs being of that hue; and the black variegations depend partly on a scanty intermixture of long hairs, which are entirely of that colour, but principally upon an exposure of the deeper parts of the general covering, which are throughout inclined to black; and in consequence of this last being the chief source whence the mottled appearances are derived, that necessarily is more or less considerable according to the position of the hair, &c. The crown of the head has a predominance of black; the sides and middle of the face anterior to the eyes, are covered by a sort of short, dull, dusky, or reddish-white hair; and a whitish streak extends backwards from thence over each eye. The sides of the head a mixture of grayish-white and black,

the upper and lower lips whitish, as is also the point of the chin, the throat, and the other under parts, as already mentioned. The ears are short and roundish, with their tips projecting but little beyond the hair with which the animal is covered; outside they are beset with long dusty whitish hair, and inside they have a mere scanty coating of the same colour. Directly in the middle of the back, about half way between the shoulders and rump, is a narrow longitudinal whitish blotch, and about the centre of the chin is a transverse darkish band. The tail is wanting; the feet and toes are covered above by a dirty reddish-white hair; the whiskers are long, black, and situated on the anterior parts of the upper lip, and some similar looking hairs occur immediately over each eye.

"The teeth in this species differ a little from those in the other Cape Hyrax, more particularly the incisors; but as I have not had an opportunity of examining them minutely, I may only mention at present, that the upper ones are more pointed, and that the lower ones stand in pairs, from the two intermediate ones being separated by a considerable interval. The latter are also a little shorter than the lateral ones, and all of them have their tips tri-dentated.

"This animal is found in many of the forests of South Africa, and is occasionally seen coming out

of holes in decayed trees, or standing upon the summits of such as have only trunks remaining.

"Little is yet known of its manners; and almost the only observation that can be elicited from the farmers and inhabitants of the parts of the country in which it resides, is, that it makes a great noise previous to the fall of rain."

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THE SWINE.

We now come to a series of animals, a part of which, in its various races, fills a very important place in the general economy of mankind,—the Swine, (*Sus* of the ancients,) including the different forms which this rather extended group exhibits in different countries, and which have received various appellations. The true *Swine* are very extended in their distribution, the supposed stock of our domestic breeds reaching over Europe, Asia, and the north of Africa, while it has been introduced and thrives in America, Australia, and the South Sea Islands. In Africa, we have also a variation of form in *Phascochæres;* in America, of *Dicoteles;* and the South Sea Islands seem to possess a distinct species of true Sow, represented on plate XIX. Of these, only the true Swine have been domesticated or used for any economical purpose; though there seems no reason to suppose, that either the Babiroussa or Dicoteles might not, with some trouble at first, become useful animals.

In their form, they are low set; the body nearly cylindrical; the head placed upon the same line with the trunk. The skin is thick, covered with strong and stiff hair, called bristles, which are in general thinly planted, and have often an under fur of fine curled hair. In many cases, however, this last is wanting, and the skin is distinctly seen among the bristles. They are furnished with a strong mane. The tail is short, and generally twisted; but in some forms it is entirely wanting. In the males, the canine teeth are greatly developed, prove formidable weapons of offence or defence, and by an enraged animal are made to inflict torn wounds of a most severe kind. Their food is mostly roots and vegetables, and also worms and insects, to procure which they are furnished with an elongated nose, supplied with a strong cartilage at the extremity, and with powerful muscles, which renders this flexible, and enables them to turn up the soft or moist ground in search of roots, or worms and insects, in which they are also assisted by their acute sense of smell. Acorns, beech-mast chestnuts, and the produce of similar fruit-bearing trees, are also a very favourite as well as fattening food; and the herdsmen of old, and even yet, in some of the English forests, avail themselves of this, and drive their pigs in autumn to feed and fatten themselves in the woodlands of oak and chestnut. When

hard pressed, however, the Swine are a race that can subsist on almost any thing placed within their reach; and scarcely any sort of food, either animal or vegetable, comes amiss to them. "Voracious" is therefore the title which has been most commonly applied to them.

The sense of smell is extremely acute; it is almost the only sense employed when the animal is rooting up the ground; and a little attention to a herd so occupied, will soon shew with what subtlety it is employed: scarcely a small root or a worm escapes; and on every fresh turning of a few inches of ground, this useful instrument is employed in trying by smell the disturbed fragments. On the Continent, this faculty is said to be sometimes employed by having the animals trained to hunt for truffles, when, we suppose, they will act as both finders and diggers. But the most remarkable instance of the culture of this sense in the Sow, was exhibited in the animal which belonged to Col. Thornton, and which was taught regularly to hunt, quarter the ground, and to back the other pointers. When hunted alone, her scent was very sure; and in one or two instances, she was known to stand steadily at snipes. In this instance, the training was accomplished by good treatment, and a reward of bread carried in the pocket of the keeper. The Wild Boar in the Parisian Menagerie was taught to go through

certain attitudes, upon being shewn some favourite food.

The Wild Boar has, in its wild state, been always looked upon as an object of terror, and, in confinement, as an animal of loathsome and dirty habits, and associated with what is beastly and disgusting. When hunted or enraged, the Boar becomes a most ferocious animal, defending himself to the utmost; but in confinement, the Sow seems conscious of good treatment, and will follow the individual who thus well uses it. For their dirty habits, they are perhaps somewhat indebted to the carelessness of their masters, and the limited and dirty space in which they are kept; for a Sow, in an ill kept sty, is, in reality, the perfect image of a "dirty beast;" but when at large, excepting their propensity to wallow, which is common to all the Pachydermes, and a provision in warm climates to protect from insects a hide naturally bare of hair, we have nothing more unseemly to separate them from their allies. The sleeping lair of the Wild Hog, is generally among some dry and warm herbage; and a supply of fresh and clean litter causes expressive comfort to the animal in his sty; and in both cases, when the cover is abundant, it is made to conceal and skreen the body from heat or cold.

We have represented on the accompanying plate,

THE WILD BOAR
Native of Europe

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Stewart delt.

Lizars sc.

WILD HOG
Female & Young

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THE WILD BOAR.

Sus scropha.—LINNÆUS.

PLATES XVII. and XVIII.

Sus ferus, porcus, aper, and scropha, of authors. — Le Sanglier, *Buffon.*

OUR drawing was from a European specimen in the Edinburgh Museum. In the ancient times of the British kingdom, the Wild Boar inhabited her forests, and was an object of royal protection. We have various records in the history of the country of its existence in particular districts, edicts for its preservation, and proclamations of punishment for its destruction. It has, however, long ceased to exist, and there are now few or no forests in that impenetrable or unexplored state, which could long support their grizzly inhabitants undisturbed. On many parts of the continent of Europe, it may yet be said to abound, and is an object of chase much followed, requiring great

courage and coolness, and attended with considerable danger. Here they are most commonly shot with rifles, or baited with strong hounds; and in other places, driven by an assemblage of the country people to a narrow circle, where they are variously despatched. But it is perhaps on the continent of India only where the hunting of the Wild Boar or Hog is followed really as a sport, and is accompanied with all the usual retinue of followers. They frequent the strong grassy jungles, thick and matted, and of sufficient length to conceal the animal even when running; or they delight in the extensive plantations of sugar cane, where they both find cover, and a supply of favourite and very fattening food. They are pursued on horseback, and speared when at full speed. When about to be hunted, a collection of people is formed, who regurlaly beat the cover, and endeavour by noises of all sorts to force the animal to flee to some other retreat. The huntsmen are generally placed at the corners, and start in pursuit when they consider the Hog has gained sufficient distance from the canes or grass, as not again to retreat to them. There is both danger in the attack, and considerable dexterity required to render it efficient: many horses will not go up to the Hog, while others are rash, and subject themselves to be bitten or ripped, and sometimes are completely disabled; while, if the rider is

thrown at all in the vicinity of the game, he is almost certain to be severely hurt.*

The speed of the Hog is much greater than what might be supposed from the look and form of the animal. A trot at first, changed into an ambling gallop, will keep some of the swiftest steeds of India for a time at a distance; and it is by pressing hard at first, and blowing the game, that it is generally come up with. Colonel Williamson mentions an instance where he, with some others, were fairly beat in a distance of three miles, the Hog gaining the cover in spite of their exertions. A chase sometimes extends to five, six, or seven miles.

The adult Wild Boar is generally of a brownish black; the hair of considerable length about the head and mane. They stand from twenty to thirty inches high at the shoulder; and Colonel Williamson mentions having seen a huge Boar of forty-two inches in height; while he speaks of three feet as a common size, which, being most active, also exhibit the best sport. The young are of a pale yellowish tint, irregularly brindled with yellowish brown. Colonel Williamson gives the characters of the wild Indian breed: "a broad flat forehead; short pricked ears, rather round at their tips, and lying very close to the neck. The

* See a long account in Colonel Williamson's Oriental Sports.

eye very full, with much display of the white when in action. The head short, thickly furnished with hair inclining to curl; a very muscular neck; a high shoulder; the back very nearly straight; the loins broad; the bristles thick on the neck and shoulder. The tail rather short, and near the tips covered with lateral bristles, resembling the wings of an arrow."* Plate XVIII. exhibits the female and young.

In its wild state, in Europe, the Wild Boar frequents the most retired forests. He lives solitary, choosing some deep recess for his lair, near a convenient watering place, and having access to some glade or path, which conducts to the more open country. Hence he only sallies in the evening in search of food, which is chiefly vegetables, roots, or fruits; but during the season of harvest very considerable damage is effected, not only to the grain crops, but also to the vineyards. It is only during the rutting season, that the native Hog is somewhat gregarious, and selects a female after an exhibition of his prowess against his rivals on the same errand. The females again, are generally gregarious, several litters joining company, and making excursions together. The young grow for several years, and remain with the mother and the herd, until they have attained their maturity.

* Oriental Field Sports, i. p. 80.

It is now admitted by all writers, that this animal is the stock whence our domestic races have arisen, and spread themselves nearly over the world, with the exception of the islands in the South Seas, whose stock we shall now advert to.

THE PAPUAN HOG

Sus Papuensis.—Lesson & Garnot.

PLATE XIX.

Cochon des papous, Sus Papuensis, *Lesson* and *Garnot Voyage du Coquile*, i. 171. pl. viii.

The large and rich isles of Papua, or New Guinea, afford a shelter and abode for this curious animal, feeding on roots and fruits which abound there. According to the above quoted naturalists, it forms a passage to the South American genus, *Dicoteles* or Peccaries. It wants the tusks, so formidable in the Wild Boar, and the tail is nearly rudimentary; but there is no trace of the gland upon the rump, or strong smell about the Papuan animal. It has, however, only eight paps, by which it approaches the Peccaries, the common Sow having generally twelve. The Papuan Hog usually stands from eighteen to twenty inches high, and the form is light and slender; the ears proportionally short; the body round in its form; the legs short. The hair is

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PAPUAN HOG.
Freycynet.

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of middling thickness, but less so than in the Siam Pig, or in the Babiroussa; the skin is brown and wrinkled, naked and reddish behind the ears, upon the cheeks, and many parts of the abdomen. The extremity of the muzzle is furnished with long black hair, most abundant on the lower jaw, and around the eyes, and two black bands stretch upon the lower jaws. The upper parts of the body and the sides are blackish red, duller and browner upon the limbs. The cheeks, throat, flanks, and belly, are white, mingled with some black hairs. The young are commonly of a dull brown, having upon the back from two to five longitudinal bands of a bright fawn colour. They are extremely common in the forests of New Guinea. The Papuans keep them confined in enclosures around their cottages, having, for the most part, trapped the young ones; but they never attempt to tame the animal, which always retains its wild and fierce manners. Those which were taken on board the Coquile, were remarkable for their strength and courage, though in a short time they became tame. They were much esteemed for the delicacy of their flesh, and formed a welcome delicacy during the voyage.

In the South Sea Islands, there is a small, short legged, black variety of Pig, which some authors are inclined to consider as derived from some other stock than the Wild Boar; but there seems

no very good reason for this conclusion, and the breed would appear to be nearest to the Chinese variety, while the animal we have represented on plate XX. *Sus koiropotamus*, is known by the figure of M. Demolin only; but in other respects our information is nearly altogether deficient. We have used for our copy the representation above alluded to.

In the races which have sprung up, the form is exceedingly varied, but, as among other domesticated animals reared for profit, a form of beauty founded upon that which yielded the greatest return, was fixed upon as the standard, and this we see in some of the unwieldy masses of flesh and fat, which are found in the stores of the principal breeders.

Stewart del.t

Lizars sc.

THE KOIROPOTAMUS

Native of the South Sea Islands

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COMMON HOG

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THE DOMESTIC PIG,

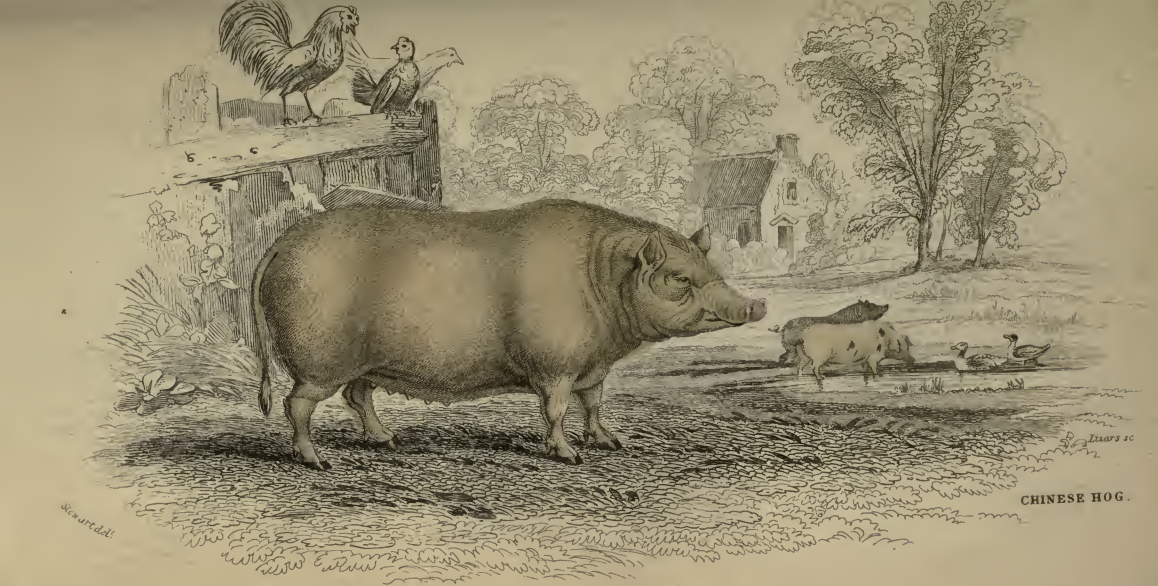
PLATE XXI.

WHICH we have selected for our illustration, was the property of a respectable baker in the town of Kinghorn, in the county of Fife; and when we got the drawing made a few days before she was killed for the market, she was about two years old. We have chosen her, not on account of any very great purity or excellence in her breeding, but simply as a fair average specimen of a common domestic Pig. She was originally from Irish stock on the female side, but from the county we have mentioned on that of the male.

There is a curious circumstance which was related to us by the proprietor of this animal, and which we know to be authentic, respecting one of the two Pigs which constituted her first litter. One died, the other survived, and became attached to a Bull Dog, also the property of the person we have mentioned, which it would follow and sport with in a variety of ways. The Pig would also

follow its master when accompanied by the Dog, for a distance extending half a dozen miles; and the Dog being very fond of swimming, the Pig imitated the same propensity, and apparently had much pleasure, and shewed a good deal of dexterity in this element, — a propensity which we believe is not very usual or natural in such animals. If any floating substance was thrown into the water for the Dog to fetch out, the Pig would follow, and dispute the prize with its canine companion, evincing much energy and adroitness. The Dog and Pig invariably slept together.

The most prominent domestic breeds Mr Cully places under three varieties, the *Berkshire*, the *Chinese*, and the *Highland*, or *Irish* breeds. The first of these, in a variety of modifications, is perhaps the most extensively spread and reared, and individuals of this breed have been known to reach a weight of above eighty stones. The Chinese breed, of a black colour, and easily fattened, has also wrought much improvement among these animals, and it sometimes reaches a state of feeding so as to present to the observer little more than a round mass. Our next figure will represent the



CHINESE HOG.

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CHINESE BREED.

PLATE XXII.

The colour is most commonly black, the form characterized by a fine appearance, small head, thin ears, and short and slender legs. They are remarkable for being easily fed, and perhaps become too fat for the general purposes of the table, and a cross is therefore oftentimes more esteemed.

The other British breeds receive their names most frequently from the county in which they were introduced and reared. Thus the Hampshire, Sussex, Suffolk, Cheshire, and Shropshire Pigs, are well known as excellent. Upon the border districts, there are also some superior breeds, which are reared to a great extent. In the extreme north of Scotland, and some of the islands, the race is very diminutive. At one period, a strong prejudice or superstition existed here against this animal in every way; but this is now fast becoming extinguished, and is replaced by a rapid improvement in the breeds.

The next animal we have to notice, is

THE BABIROUSSA.

Sus babiroussa.—LINNÆUS.

PLATE XXIII.

The Babiroussa of authors.—Sus babiroussa, *Linn.* &c.—Le Babiroussa, *Fred. Cuv. Hist. des Mammiff.*

THIS rather handsome animal is very remarkable for the great development of the tusks, which project from both jaws, and form a circular turn upon each side of the nose. It is from these tusks, very conspicuous in the wild animal, that, it is conjectured, the name of Babiroussa, literally Hog-deer, has been applied to it, and not from any similarity in the make of the animal to the form of a Deer, for, with the exception of the limbs being more slender, there is no other similitude whatever. Fred. Cuvier says, that the upper tusks pierce the skin of the muzzle before coming upwards; they form nearly a circle, and often touch the skin of the animal a second time. Living, or entire specimens, have seldom, till lately, reached Europe, and we have used the figures of F. Cuvier,

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Rivers sc.

BABYROUSSA. Male & Female.
F. Cuvier.
Native of Molucca Islands.

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which were made from specimens brought by the Astrolabe to the Paris collection. They were a male and female; the latter bred once after arriving in Europe, but the cold gradually producing diseased lungs, cut them off in about three years after. The male was aged, and remarkably fat, which rendered him inactive, and his short life was passed in sleeping, eating, and drinking. The female was younger, and more active; when the male retired to his litter, she would cover him completely over, and afterwards herself slip under the straw, so that both were entirely concealed from sight. The skin of these animals was very thinly furnished with hair; and that which grew upon them was long and hard. The colour of the skin was of a uniform greyish tint, changing to fawn colour on the belly. The number of the incisor teeth in the Babiroussa differ from those of the true Swine, but the structure is the same. The tusks in the old male are not so dangerous as those of the Wild Boar during attack, owing to their curvature, but nevertheless they are formidable weapons.

These animals abound in the Molucca Islands, and a few of the others of the Indian Archipelago, chiefly towards the interior. They seem difficult to obtain, notwithstanding their acknowledged plenty; and when hunted, are said to take the

sea freely, and swim to some other neighbouring island.

Our next animals exhibit a very remarkable African form. There seems, without doubt, to be two species,—one from the south-west, the other from the north of the continent. The correct synonymy of the first, or oldest known, seems yet somewhat confused; and the unravelling of the Sus Larvatus, the Sus Ethiopicus, and Ethiopian Hog of Daniel, is left even by our latest zoologists in uncertainty. The eighth volume of the Memoirs du Musée will contain the best account of the variation of the skulls, and of the dental system. *Phascochaeres* has been applied as a generic term to this form, remarkable for the large and strong tusks, and for the swollen and warty appearance of the face; we have taken Ruppel's figure for our first illustration, and give his description entire, so little being yet known regarding these formidable looking creatures.

AELIAN'S PHASCOCOCHŒRES

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ÆLIANS' WART-HOG.

Phascochaeres Æliani.—RUPPEL.

PLATE XXIV.

Phascochaeres, *Æliani, Mus. Franc.* — Ælians' warzenschweer., *Ruppel, Atlas*, vol. xxv. p. 61.

AFTER having carefully compared those species of animals which were sent to us by our traveller from the north of Africa, we were led to consider that they are always of smaller size than those found in the Cape, although in other respects, and characteristic features, quite the same, and to be considered as identical. Keeping well in mind this consideration, it was only after a very careful examination that we were induced to regard the Wart-Hog, which is to form the object of the following description, as different from the species which is found on the Cape; and we shall just give our reasons for it.

We mention, first of all, the acute judgment of Fred. Cuvier, on the dental formation of the Wart Hog, in the Memoir du Mus. d'Hist. Natur.

vol. viii. p. 450. He notices in the skull of a Wart Hog in the Parisian collection, the existence of two incisors in the intermaxillary bone, which he considers, therefore, as denoting a peculiar species; because the upper incisors of the species at the Cape are not only entirely wanting, (even in the young individuals,) but, in consequence of the thin leafy substance of the intermaxillary bone, cannot even take root in it. His reasons for considering both of the same genus, notwithstanding the absence of the upper incisors in the one, are sufficiently supported by the circumstance, that the same occurs in others of the Pachydermes, as in the case of the Rhinoceros. Cuvier accompanied the above distinction between the two Wart Hogs, by a representation of the two skulls which guided his judgment, and we instantly recognized our new species.

The discovery of two new species of the genus Phascochaeres, is thus due to the merit of Fred. Cuvier. What we add on that subject, we merely wish to give as an additional inquiry supporting the labours of that learned naturalist, and with an intention of corroborating his views. A considerable number of that same species which were sent to us by Ruppel, enables us to state the following facts as well established. *First.* All the individuals of our new species, whether of old or young animals, and such as had not yet atta'ned

their full growth, of both sexes, have, in the intermaxillary bone, two incisors, which have their crowns turned inward, and their roots sharply pointed in an outward direction, wedged into the lower plate of the intermaxillary bone. These upper incisors are of greater size in males than in females, are generally larger in animals that have obtained their full growth than in younger ones, and do freely rise a few lines above the axis of the palate. In the lower jaw, we observe six incisors, which are not wanting even in the very old animals. The lower incisiors, to the number of six, have invariably been found of larger size in old animals than in young ones, and none of the oldest individuals we possess want either of these teeth.

Second, The upper corner teeth have on their outer and inner surface a groove, which is continued with the curve at the teeth. This groove is wanting in the lower corner teeth, which in old animals are by a third smaller than the upper ones.

Third, In all which we used for our general description, both in young animals and such as had obtained their full growth, of both sexes, we found in the upper jaw four back teeth, and three in the lower jaw. The first and second are small, narrow, roundish, with simple crown-globules, and with two roots wedged into two separate

alveolæ. The third, (in the upper jaw, and the second in the lower,) is strong, and as broad as the fourth; its enamel surface contains five crown-globules, four of which occupy the corner, and one the middle. It is wedged into four separate alveolæ, by means of four roots.

With regard to these three first back teeth we would remark, that as age advances they gradually disappear, and none remain except the anterior ones. In one animal, greatly advanced in age, we find all three of them almost entirely destroyed. The third is diminished by two-thirds, and nothing remains of it but the crown surface, which keeps its position only by being wedged in between the fourth large one, and the second back tooth; whilst the alveolæ, which held its roots, have entirely vanished. But even this animal had all its upper and lower incisors still, although in a somewhat worn-out state. Fred. Cuvier, in explaining this circumstance, shews, that the fourth or posterior back tooth, which, in growing, is pushed forward towards the front, in the same manner as we find this in the Elephant, causes thereby the falling out of the anterior teeth. We admit the soundness of this view, and readily believe that the continual growing of the posterior back tooth should injure and remove the anterior ones, or even cause them to fall out. But besides, our attention has been directed by

this subject towards the really two-fold type in the construction and the diversity in growth of the back teeth of the Wart Hog. We find, namely, the three anterior back teeth shaped and nourished in quite the same manner as all other teeth provided with enamel bodies and real roots. We farther must suppose a decay and dying away of the nourishing organ (bulbus) of these anterior back teeth, whenever they have obtained their full growth, (whether these animals experience a change of teeth we cannot say, as none of the animals in our possession would justify us in asserting such a change,) and thus they are deprived of nourishment, which circumstance we would state as the cause why the alveolæ are then filling with a bony substance, and loosen, and finally push out the tooth they contained; which tooth, in old age, is diminished to less than half its size, in consequence of the drain sustained by its solid organ of nourishment. The three anterior back teeth are thus, by the nature of their construction and functions, as much subject to decay and falling out as the teeth of all other animals advanced in age. It is altogether different with respect to the fourth, the largest and hindmost of the back teeth. The latter is, as Fred. Cuvier observed, a *compound* tooth,* (*dent composee,*) and

* S. des Dents des Mammiferes, Disc. praelim. p. xlvi.

to be placed into the same class as the back teeth of the Elephant. It consists of three rows, placed alongside of each other, at well connected tubes, each about two inches long. At the outer side, we count nine such tubes, eight at the inner, and seven at the middle row, (this was the case in an old individual, in some animals we found several middle tubes double,) which tubes can be distinguished from each other at the enamel surface by their oblong globules. Each of these tubes, even the foremost or most recently formed, is hollow in the lower two-third portions, or closed up towards the enamel surface, and contains the bulb, (*bulbe*, Fred. Cuvier,) destined for the continual nourishment of the individual tubes, which bulb was distinctly noticed by us, after soaking the skulls. All the tubes of this tooth are free towards the root-end, and contained in one common large alveola, which is hollow at the bottom, only the anterior tube excepted, which at the lower end, and in an anterior direction, is separate from the rest of the tooth; whereby a gap is formed between it and the second tube, which gap is filled with a bony substance, a circumstance peculiarly obvious in that of the lower jaw. This fact would suggest a doubt, whether the posterior back tooth would push forward towards the anterior side; although we did observe in younger dividuals the after growth of the posterior tubes

as typical of the animal. The lower jaw contains only three back teeth. The two anterior ones are formed like the upper ones, with two and four roots; and what we mentioned with regard to the posterior or fourth back tooth at the upper jaw, is perfectly applicable to the third or posterior one of the lower jaw.

From the above remarks on the teeth of the Wart Hog, we are led to the following conclusions:—1st, That the species examined by us, is at all ages provided with incisors in the upper and lower jaw; and therefore, in the most marked manner, distinguished from the species found at the Cape. An additional mark of distinction is mentioned by Fred. Cuvier, who says, that the Wart Hog at the Cape has in its upper and lower jaw only three back teeth; whereas the species examined by us constantly presents four in the upper jaw. But we hesitate in admitting this latter mark of distinction to be of much weight; because, as was stated above, the anterior back teeth are disposed to decay, and the alveolæ which contained the teeth are filling up, which might have well occurred in the case of those very animals which were examined by Frederick Cuvier. 2d, That the formation of the back teeth of the genus Phascochaeres occurs in a two-fold type; we must adopt one regarding the formation and manner of nourishment for the

anterior ones, which are simple teeth, with enamel crowns, bodies, and real roots; and we must take another for the posterior large ones, which are compound teeth, (*dents composees,*) without roots.

This remarkable fact, the co-existence of two different types of formation for the back teeth of one and the same animal, will assume even a greater importance from an exact examination of the vessels and nerves which conduct to the different teeth; and we wish to direct the attention of naturalists to this subject, because we think that it will be an easier matter to procure subjects fit for such an inquiry from the Cape, than from Abyssinia.

But besides the existence of the incisors in the intermaxillary bone of our Wart Hog, and the absence of these incisors in the species of the Cape, we would now give some farther marks of distinction in the skulls of both, which, from their constant character, are available for the specific determination of the animal.

If a line be drawn from the hind part of the head, as far as the most prominent part of the nasal bone, we shall find between the two points (in the case of the Wart Hog we are describing) a sinus, the depression of which falls in the middle of the line, where it declines nine inches from the plain. Now, this very spot, in the case of the Wart Hog of the Cape, rises up in

an arched prominence.* Again, the Abyssinian Wart Hogs are more in diameter than those of the Cape; their forehead is pressed inward, and, what is very conspicuous, the space between the upper and posterior eye socket border, to the end of the occiput, is longer by one half than in the Cape Wart Hog, which gives to the whole skull a sort of lengthening shape, and pushes the occipital bone more backwards. We consider these two marks of distinction as constant, because we invariably found them to exist.

F. Cuvier gives, in his memoirs, to the Wart Hog of the Cape, the name of *Phacochoere d'Ethiopie*, and he calls ours *Phacochoere d'Afrique*. If we have not acceded to his wish, that these two names should be retained, we state our reasons for not complying, as follows: — We strictly follow the injunctions of Illiger, who objects to designate animals by countries, rivers, &c. as proving, in his opinion, injurious to science. In the next place, we were inclined to call our Phascochaeres by the name of Ælian, to have an opportunity of proving, at the same time, that

* That this arched prominence is constant, may be seen from a representation of the animal by Fred. Cuvier, and an examination of the skulls in the Leyden museum, undertaken by Temminck; according to which, we find that all the skulls of the Cape Phascochaeres, and another from the land at the Ashantees, have the same external form.

this ancient author had a not-to-be-mistaken knowledge of our species. Ælian de Animalium Natura, liber xvii. cap 10, says : —" Λέγει δὲ Δίνων ἐν Αἰθιοπα γένεσθαι τους ὀρνιθας τους μονοκερως, και πρόβατα ἐρίων μὲν ψιλὰ τρίχας δὲ καμήλων ἔχοντα." " Dinon tells us, that in Æthiopia, Unicorn birds, and four-horned Hogs, and Sheep, are found, which have no wool, indeed, but the shaggy tufts of hair of Camels." The animals mentioned in these few words would appear as fabulous, if we were to take the words in their literal sense, according to our present notions. But if we compare this statement with those animals which still now-a-days are found in the Æthiopia of the ancients, we may not be wrong in suggesting that Dinon, in his imperfect description, meant by the Unicorn bird, the *Buceros corniculatus*, (Le Vaillant ;) by the four-horned Hog, our Wart Hog ; and by the Sheep, which was covered by the shaggy tuft of Camel hair, the *Ovis tragelaphus*, (Geoffrey.) The reporter of these strange animals has, comparatively speaking, called the prominence on the bill of the *Buceros corniculatus* a horn. In like manner, the very large corner teeth of the Wart Hog have been represented by him as horns ; and lastly, in using the word τρίχας, he gave such an excellent description of the shaggy tuft of hair of the *Ovis tragelaphus*, that we scarcely entertain any doubt

concerning the truth of our interpretation, but do really believe that he meant to convey, by his few designations, a description of these three animals. Considerations such as these, and still more the respect due to the wisdom of the ancients, have induced us to call our Wart Hog by the name of Ælian.

The external appearance of the Wart Hog is as follows: — The whole skin is of an earthy colour, scantily covered with bristles. Between the ears arises a mane, which extends along the neck and the back, and the single hairs of which are frequently ten inches long. The bristles of this mane, as well as on the rest of the body, are of light brown colour, and have not each of them their individual root, but three or six bristles together form one tuft, and have one common root. As the whole body, except on the back, is but scantily provided with hair, it presents rather a bare appearance. The head along the brow is broad, the latter somewhat depressed; the eyes are small, and situated very high up; from the brow downwards to the naked ridge, occurs a depression below the eyes, and in the vicinity of the cheek, is a wart which, in comparing it with another smaller one, alongside the cheek, we call the larger wart. These warts are formed out of a thickened skinny tissue; and we find them considerably smaller than in the species of the Cape.

Along the lower edge of the lower jaw, we perceive a whisker of white hair curled upwards. The eyes are small, with light black eye-lashes, and long black eye-brow bristles, and a tuft of bristles is under the eyes. The ears at the lower part of the external margin are cut obliquely, and the whole margin is bordered with white bristly hair. The tail is almost bare, thin, and its joint provided with a tuft of hair. On the fore-feet is a piece of protuberant thick hard skin. Our Wart Hog has been found by Ruppell, first at Kordofan, and more frequently afterwards at the eastern slope of Abyssinia. It frequents low bushes and forests. If in quest of food, which, as far as could be ascertained, merely consists of roots, it creeps on its bent fore-feet, and in this posture digs up the roots of plants by means of its huge corner teeth. It likewise moves on in this posture, by allowing its hind legs to push the body forward. The natives of Massawats call it *Flaruja*, those at Kordofan, *Flalluf*. They do not eat its flesh, but travellers declare that its taste is not unpleasant.*

We have now reached the American form of the Swine, seen in the genus *Dycoteles* or *Peccaries*. They vary in the number and modified form of the teeth — in sometimes wanting

* Crech. in Rupp. Atlas.

the small accessory hoofs—in the metatarsal and metacarpal bones of the two great toes being soldered together, as in the ruminants—in the tail being nearly rudimentary,—and in having a gland upon the rump, distilling a strong smelling liquor. The form will be illustrated by

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THE ÆTHIOPIAN WART-HOG.

Phascochœres larvatus.

PLATE XXV.

As far as we can judge, the Ethiopian Boar, and the *Sus larvatus*, or Masked Boar of authors, are identical. The figure commonly referred to for the last, is that in Daniel's African Scenery, which we have now used, and we add the description which accompanies it. Little is known of its habits, but they are most probably similar to those of the preceding animal.

" There is not, perhaps, a more disgusting, or a more savage animal, than the Wild Hog of Africa. This beast, as well as the Elephant, the Buffalo, and the Rhinoceros, abounds in the woods of Sitsikamma, and is generally hunted by Dogs, which, with its long sharp fangs growing out of the lower jaw, it sometimes lacerates in a dreadful manner, and frequently tears them to

ETHIOPIAN WART-HOG.
Daniel

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death. Its eyes are small, and placed high in the forehead; two remarkable excrescences grow like two ears out of its cheeks, and the lower part of its head appears as if enclosed in a sack. The neck, the shoulders, and the breast, are covered with long hair. It differs very considerably from the Babiroussa or Ethiopian Hog, which is also a native of the Cape."

THE COLLARED PECCARY.

Dycoteles torquatus.

PLATE XXVI.

Sus Tajussu, *Linnæus.* — Peccari, *Buffon.* — Dycoteles Torquatus; Taytetou Azara, *Cuvier.*

The Collared Peccary inhabits the eastern side of South America, frequents the forests, living on vegetables and roots, and occurs chiefly in small families. To outward appearance, at a little distance, it is of a grayish tint; but a narrower inspection shews the hairs alternately ringed with black and yellowish white. They are stiff and strong in the dried skin, having the rigidity of bristles; along the neck and back, they are very long, and form a kind of bristly mane, which, with nearly the whole hair upon the body, is erected and bristled up upon irritation. From behind the shoulders to the fore part of the neck, the bristles are whitish, forming a narrow oblique line of that colour, whence the specific name is derived. Upon the rump, the gland, though concealed, is

COLLARED PECCARY
Native of S. America.

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conspicuous from the turn or swirl of the hair around it; and when in confinement, or in a tame state at large, the animal appears to have pleasure in frequently rubbing it; and when approached by those with whom it is familiar, endeavours to rub this part against their legs. We had an opportunity of often seeing a tame specimen of this Peccary. It was quite familiar, was generally allowed to run at large, and would come to any person upon food such as it delighted in being offered to it. It was, however, at other times easily irritated at strangers, and would turn the head, and appear as if about to rip with its short tusks. It detested dogs, shewed its bristles, and few ventured a second attack, being always touched with the tusks in the first. It would also occasionally stray to a considerable distance. Mr Bennet describes those in the Zoological Society's Garden as perfectly tame and quiet, but is not sure how far it might be safe to trust them. They seem hardy, having lived and thriven through two winters without more than ordinary protection.

The next species is,

THE WHITE LIPPED PECCARY.

Dycoteles labiatus.—Cuvier.

PLATE XXVII.

Taquicati Azara.— Dicoteles labiatus, *Cuv.*—La Tojacu, *Fred. Cuvier.*—The White Lipped Peccary, *Bennet, Gardens of Zool. Soc.* i. p. 60.

This species is considerably larger than the last, but is at once distinguished from it by its darker colour, and the conspicuous white margins of the lips. The hairs on the body are black, with a few brownish rings, which are most conspicuous about the head, and thence modify the tint. The whole of the under lip, the sides of the mouth and nose, are white, whence the name ; and the mane and hair about the head are so long as nearly to conceal the ears. In the young animal Mr Bennet mentions, the skin is more varied, being in some degree striped like that of the young Wild Boar of Europe. But these stripes are lost by degrees as the animal advances in age, and few traces of them remain after the first

WHITE-LIPPED PECCARY

Native of Paraguay.

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year. Mr Bennet mentions that the gland in this species is inodorous.*

They inhabit Paraguay, and are gregarious, assemble in vast troops, generally led, it is said, by some old male; sometimes a thousand assemble together, and stretch for a mile in length. Like many of the ruminants, they obey the conduct of the foremost. If any obstacle has to be crossed, a deliberation ensues; but as soon as one has passed, the difficulty is overcome, and the same place is chosen by the whole troop. They appear to be excellent swimmers, and in this way a river is crossed after the first has ventured on the plunge. These bands, would attack a huntsman if in the way, or molesting them.

The Peccaries are said, by all those who have partaken of them, to be excellent eating; and Sonnini frequently mentions the delicious repasts in the forest. Being, in addition, animals so easily tamed, and becoming so tractable, and feeding upon a very small allowance, it is to be regretted that some attempts have not been made for their more general introduction. We are not aware that they are even domesticated in America.

For a time our climate would be unfavourable, but by breeding they would harden in constitution, as those in the Society's Gardens have proved.

* Bennet, Gardens of Zool. Soc.

THE TAPIRS.

The Tapirs are the last of the existing animals which we have to notice, belonging, as we before stated, to the *Anoplotheres* of Swainson, who has used this extinct and comparatively unknown form as the type of one of his families. They are very remarkable, exhibiting a rounded compact form, standing a considerable height from the ground, and having the nose and nostrils more prolonged than in any of the Pachydermes, except the Elephant, employing this part of their structure as an organ of touch and smell, and partially of prehension. Three species are known, — two inhabiting America, and one part of the Asiatic Islands; while it is said that D'Orbigny has discovered a new animal belonging to this group, in South America, but it has not yet been noticed in the numbers of his important voyages at this time published. They are harmless and inoffensive creatures, never attacking unless attacked; sluggish in the extreme, according to

most of their describers; inhabiting the thickest forests, and issuing only on the approach of twilight to feed, after a day spent in sleep or sluggish repose. They feed chiefly on vegetables; but in confinement are by no means nice in their food, and will even swallow substances altogether extraneous, such as pieces of stick or metal. They are very easily tamed, become familiar, and know their master, and will follow him, even when they are permitted their liberty; and it has been thought that a little care would train them to become useful beasts of burden, for which their immense strength would well fit them.

The dentition of the Tapirs is different from the other Pachydermes. There are six incisors and two canine in either jaw, seven molar teeth in the upper, and six in the lower jaw. In osteology they approach near to the Rhinoceros and the Hogs. The intestinal canal is simple, but differs remarkably in the American and Indian animals.*

In the first the stomach is small; the intestines of moderate length, the cœcum large. In the latter it is the reverse, the stomach is large, the intestinal canal very long, the cœcum small. The dentition of the two animals is similar.†

The bodies of the Tapirs are covered with

* Bennet. † Yarrel, Zool. Journal

thinly set but closely growing stout hair, rising to a somewhat bristly mane in one of the American species. The skin itself of all is remarkably strong, enabling them to crush through the deepest and most short pointed thickets, and presenting a strong defence from other assailants. We shall proceed with the description of

AMERICAN TAPIR.

F Cuvier

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THE AMERICAN TAPIR.

Tapirus Americanus—Linn.

PLATE XXVIII.

Mborebi, Azara.—Tapirus Americanus, *Linn.* also Hippopotamus terrestris—Tapir Americain, *Lacepede*—Tapir d' Amerique, *Fred. Cuvier, Hist. Naturelle des Mammif.*

This animal is the largest quadruped in South America, and is extensively distributed over that continent, extending over almost every part of it east of the Andes, but probably most abundant within the tropics. It reaches from five to six feet in length, is powerfully formed, and is covered with a scanty close lying hair, forming a bristly mane upon the neck. The colour is a deep brown. "The sides of the lower lip, a band occupying the middle of the chin beneath, the upper edges of the ears, and a naked line at the junction of the hoofs, are all purely white."* The young are of a lighter colour, and spotted or striped for the first year at least. That described by Mr Yarrel from the Zoological Society's Menagerie, was "of a rusty reddish brown, with

* Bennet.

indications of lighter spots and horizontal lines on the ribs, flanks, and thighs."

This animal is frequently hunted by the South Americans with dogs, sometimes it is trapped, sometimes killed with poisoned arrows by the natives, and occasionally it is shot. In all the contests, it is with difficulty mastered, for though inoffensive, its thick skin withstands the attacks of the dogs, and its great strength allows it to handle very severely those who are foremost or boldest in the attack. It is either surprised from its lair, or intercepted at early dawn, on its return from its feeding ground; and when pursued, makes always for water, where he can stand on his defence, while the dogs are obliged to swim around, and are incapable of exerting all their powers. The skin is remarkably thick, and is said to resist a musket ball. M. Roulin mentions having fired at one crossing a stream, and seeing his ball make an impression on the back without farther harm. This might glance off, but we question if the skin of any of these large animals would resist a ball directly fired from a properly loaded and efficient gun. They are hunted for the skin, which is strong, as we have mentioned, and also for the flesh which the Indians delight in; but which is said to be coarse and unpalatable to the unaccustomed stomach of the European.

The other American species is

TAPIR OF THE ANDES.

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THE TAPIR OF THE ANDES.

Tapirus pinchaque.—ROULIN.

PLATE XXIX.

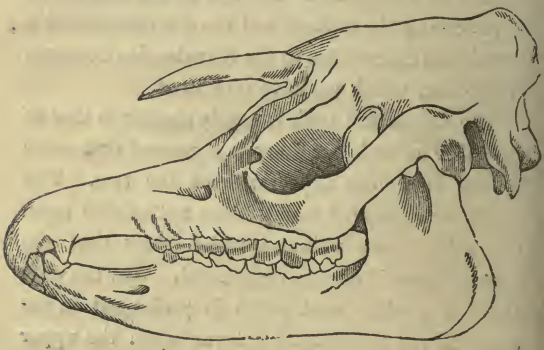
Annales des Sciences Nat. 1829, p. 26, vol. i.

IT had long been suspected by M. Roulin, from the accounts of Oviedo and P. de Aqueda, that a second species of Tapir existed in South America; and from being described to possess a long and thick hair, that gentleman commenced his inquiries and researches regarding it, among the higher regions of the Andes. He was at last successful in procuring the animal, and has communicated a sketch and description in the Annales des Sciences Naturelles, which we have now used.

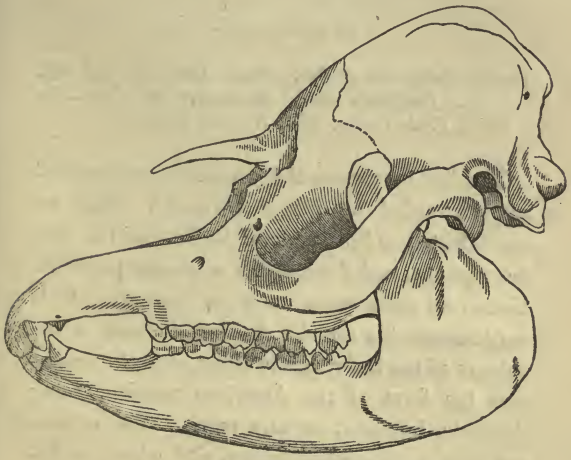
The size of the adult is nearly similar to that of the other animal, but there is a general difference in the form and appearance of the two. The trunk, or elongated snout, does not exhibit upon the sides those wrinkles which shew that the animal keeps it always contracted. On the chin there is a white spot which is prolonged to the angle of the mouth. and returns upon the upper

lip for nearly half its length. The ear is without the white border, and there is not the remarkable crest which commences behind the eyes, and runs upon the shoulder of the common animal. The neck of the Alpine animal is perfectly round, and the hairs upon the centre are neither longer, nor do they lie in another direction; there is, in fact, no trace of a mane. The hair upon the whole body is very thick, long, and of a blackish brown, deepest upon the tips, which gives the peculiar tint denominated, when referring to horses, "*bay*." On the haunches, on each side, there is a spot, about the size of the hand, devoid of hairs, but exhibiting no callosity.

The form of the skull exhibits a still more marked difference, which will be seen in the accompanying representations.



This animal was about five feet six inches in length, and about two feet nine inches in height at the shoulder. The entrails having been removed to facilitate its transportation, the food could not be ascertained. The hunters, when they discovered the animal, noticed that it was feeding on a sort of bamboo, and pointed out another plant on which they particularly delighted, a species of *Espeletia*.



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THE MALAY TAPIR.

Tapirus Malayanus — RAFFLES.

PLATE XXX.

Tapirus Malayanus, *Raffles, Trans. Linn. Soc.* vol. xiii. p. 2. — *Horsfield's Zool. Researches in Java* — Le Maiba, *Fred. Cuvier, Hist. Nat. des Mammif.*

THE first specimens of this animal were procured and forwarded by Major Farquhar, while we are indebted to Sir Stamford Raffles for the first descriptions, and through his assistance to Sir E. Home, for some notes upon its anatomy It is very remarkable for the decided contrast of the colours of the body, but in other respects resembles the form of the American animals, being destitute, however, of any mane. The colours are very deep purplish brown, and white, as distributed on the figure of our plate; the skin thick, but thinly covered with hair; the ears bordered with white. The young, according to Major Farquhar, "until the age of four months, is black,

MALAYAN TAPIR.

F Cuvier

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and beautifully marked with spots and stripes, of a fawn colour above, and white below; after that period it began to change the colour, the spots disappeared, and at the age of six months it had become of the usual colour of the adult." It was of a very mild and gentle disposition, tame and familiar as a dog, fed indiscriminately on all sorts of vegetables, and was very fond to attend at table, to secure bread, cakes, and the like. Sir Stamford Raffles' living specimen was occasionally allowed to roam in the park at Barrackpore, and it frequently entered the ponds, and appeared to walk on the bottom under water, and not to make any attempt to swim.

The Malay Tapir is from six to eight feet in length, and from three to three feet and a half in height at the shoulders. The manners, so far as known, are similar to those of the American Tapir. It inhabits the forests of the Malay Peninsula, and some of the Indian islands, leading an equally inoffensive life, and receiving ample sustenance from the vegetable productions of these luxurious regions. The flesh, though eaten by the Indian with relish, does not seem to cause it to be so much hunted as the American beast, and we are rather surprised that an animal of such bulk and singular markings remained so long unknown, and now remains so much unnoticed with regard to its habits.

We have now noticed all the existing anima which range in this division, and as we befo stated, will refrain from mentioning those which a extinct. They have been placed under the nam of Palœotherium, Lophiodon, Anoplotheriu Xiphiodon, and Dicobunes. They are in si from that of the Rhinoceros to a small Pig.

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THE END.

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to NRLF
Renewals and recharges may be made 4 days
prior to due date

DUE AS STAMPED BELOW

SEP 10 1989

ONE DAY

FEB 04 2003

REC'D BIOS

FEB 04 '03 -3 00 PM

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42
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v. 23
BIOL. LIB.